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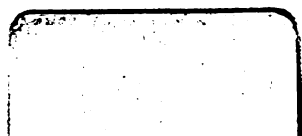
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09/11/11





PROCEEDINGS
OF THE
UNITED STATES VETERINARY MEDICAL ASSOCIATION.

SESSIONS OF 1891-1892.

EDITED BY
W. HORACE HOSKINS, D.V.S.,
PHILADELPHIA.

PHILADELPHIA:
PRINTED FOR THE ASSOCIATION.
1893.

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ERRATUM.—Page 104, line 21, for "scale" read "scab."

OFFICERS — 1891-92.

PRESIDENT.

R. S. HUIDEKOPER, 129 W. 52d St., New York City.

VICE-PRESIDENT.

W. L. WILLIAMS, Lafayette, Indiana.

SECRETARY.

W. HORACE HOSKINS, 12 S. 37th St., Philadelphia.

TREASURER.

JAMES L. ROBERTSON, 409 Ninth Ave., New York City.

COMMITTEES AND RESIDENT STATE SECRETARIES
— 1891-92.

COMITIA MINORA.

J. F. Winchester, <i>Chairman</i> ,	Thomas B. Rayner,
R. A. McLean,	A. Liautard,
Wm. Dougherty,	J. H. Stickney.

Olof Schwartzkopff.

INTELLIGENCE AND EDUCATION.

Austin Peters, <i>Ch'n</i> ,	P. Paquin,
E. C. Ross,	A. H. Baker,

James A. Waugh.

FINANCE.

T. B. Rayner, <i>Ch'n</i> ,	Geo. H. Berns,	W. J. Coates.
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COMMITTEE ON DISEASES.

A. W. Clement, <i>Ch'n</i> ,	James L. Kidd,
J. F. Winchester,	M. E. Knowles,

John Casewell.

PRIZE.

D. E. Salmon, <i>Ch'n</i> ,	D. J. Dixon,	N. P. Hinkley.
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ARMY LEGISLATION.

W. B. E. Miller, <i>Ch'n</i> ,	C. B. Michener,	F. L. Kilborne.
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PUBLICATION.

W. H. Hoskins, <i>Ch'n</i> ,	S. E. Weber,	W. S. Kooker.
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SPECIAL COMMITTEE ON FOOD INSPECTION.

Olof Schwartzkopff, <i>Ch'n</i> ,	G. C. Faville,	W. Bryden.
-----------------------------------	----------------	------------

RESIDENT STATE SECRETARIES.

G. W. Pope, Alabama, <i>Chairman</i> ,	M. A. Piche, Montana,
Harrison Whitney, Connecticut,	John S. Meyer, Missouri,
C. A. Cary, S. Dakota,	A. W. Clement, Maryland,
H. P. Eves, Delaware,	J. P. Turner, Nebraska,
E. S. Walmer, Washington, D. C.	William H. Lowe, New Jersey,
A. J. Thompson, Indiana.	W. T. Russell, New Hampshire,
C. E. Hollingsworth, Illinois,	Wm. R. Howe, Ohio,
S. Stewart, Iowa,	John Wende, New York,
D. Lemay, Kansas,	C. D. McMurdo, Oklahoma T'y,
James L. Kidd, Kentucky,	• W. S. Kooker, Pennsylvania,
Gerald E. Griffin, Indian Terr'y,	John A. McLaughlin, R. I.,
F. L. Russell, Maine,	B. McInnes, South Carolina,
L. H. Howard, Massachusetts,	J. W. Schiebler, Tennessee,
E. A. A. Grange, Michigan,	John A. Myers, Virginia,
H. N. Waller, Minnesota,	S. B. Nelson, Washington,
Tait Butler, Mississippi,	*V. T. Atkinson, Wisconsin,
E. D. Roberts, Wisconsin.	

FOREIGN CORRESPONDING SECRETARY.

J. H. Frinck, New Brunswick.

* Deceased.

OFFICERS — 1892-93.

PRESIDENT.

W. L. WILLIAMS, Lafayette, Indiana.

VICE-PRESIDENT.

A. W. CLEMENT, 210 St. Paul St., Baltimore.

SECRETARY.

W. HORACE HOSKINS, 12 S. 37th St., Philadelphia.

TREASURER.

JAMES L. ROBERTSON, 409 Ninth Ave., New York City.

OFFICERS — 1863-93.

* Deceased.

PRESIDENTS.

1863-64 Dr. J. H. Stickney.	1879-81 J. L. Robertson.
*1864-65 A. S. Copeman.	1881-83 W. Bryden.
*1865-66 C. M. Wood.	1883-85 W. B. E. Miller.
*1866-67 R. H. Curtis.	1885-86 L. McLean.
*1867-69 R. Wood.	1886-87 A. Liautard.
*1869-71 E. F. Thayer.	1887-89 R. S. Huidekoper.
1871-75 A. Large.	1889-90 C. B. Michener.
1875-77 A. Liautard.	1890-92 R. S. Huidekoper.
1877-79 C. P. Lyman.	1892-93 W. L. Williams.

VICE-PRESIDENTS.

*1863 R. H. Curtis.	1866 W. A. Wisdom.
*Wm. Saunders.	A. Phillips.
E. F. Ripley.	G. W. Bowler.
R. McClure.	J. F. Budd.
Wm. A. Wisdom.	O. H. Flagg.
G. W. Bowler.	1867-69 W. A. Wisdom.
R. Jennings.	1869-71 I. Michener.
*1864 R. H. Curtis.	1871-74 W. Saunders.
*Wm. Saunders.	1874-77 T. S. Very.
E. F. Ripley.	1877-79 W. Bryden.
G. Mellor.	1879-80 J. H. Stickney.
*Wm. A. Wisdom.	1880-81 O. H. Flagg.
*G. W. Bowler.	1881-83 L. McLean.
J. C. Walton.	1883-84 W. J. Coates.
1865 Wm. T. McCoun.	1884-85 L. H. Howard.
*W. Saunders.	1885-86 J. B. Cosgrove.
*W. A. Wisdom.	1886-88 W. L. Zuill.
I. Michener.	1888-89 J. C. Myers, Jr.
J. C. Higgins.	1889-90 D. J. Dixon.
E. F. Ripley.	1890-91 A. W. Clement.
1866 E. F. Ripley.	1891-92 W. L. Williams.
	1892-93 A. W. Clement.

OFFICERS.**SECRETARIES.**

1863 A. Liautard.	1869-74 J. L. Robertson.
1864 R. Jennings.	1874-77 J. D. Hopkins.
1865-67 C. Burden.	1877-80 A. A. Holcombe.
1867-69 J. F. Budd.	1880-89 C. B. Michener.
1889-98 W. H. Hoskins.	

TREASURERS.

*1863 A. S. Copeman.	1865-69 E. F. Thayer.
*1864 C. M. Wood.	1869-85 C. Burden.
1885-93 J. L. Robertson.	

COMMITTEES AND RESIDENT STATE SECRETARIES — 1892-93.

INTERNATIONAL COMMITTEE.

R. S. Huidekoper, <i>Chairman</i> ,	Olof Schwartzkopff,	} <i>ex-officio</i> .
A. Liautard,	W. L. Williams,	
D. E. Salmon,	A. W. Clement,	
A. H. Baker,	W. Horace Hoskins,	
J. H. Stickney,	J. L. Robertson.	

COMITIA MINORA.

R. S. Huidekoper, <i>Ch'n</i> ,	S. Stewart,
A. Liautard,	T. J. Turner,
R. A. McLean,	C. E. Hollingsworth,
J. F. Winchester.	

INTELLIGENCE AND EDUCATION.

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J. C. Myers, Jr.,	H. P. Eves,
L. H. Howard.	

FINANCE.

C. C. Lyford, <i>Ch'n</i> ,	Wm. Dougherty,	W. B. E. Miller.
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COMMITTEE ON DISEASES.

J. F. Winchester, <i>Ch'n</i> ,	Joseph Hughes,
Wyatt Johnston,	J. B. Paige,
S. Stewart.	

PRIZE.

C. P. Lyman, <i>Ch'n</i> ,	W. H. Lowe,	L. McLean.
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ARMY LEGISLATION.

Olof Schwartzkopff, <i>Ch'n</i> ,	D. Lemay,	C. B. Michener.
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PUBLICATION COMMITTEE.

W. Horace Hoskins, <i>Ch'n</i> ,	Austin Peters,	T. B. Rayner.
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SPECIAL COMMITTEES.

To consider the subjects and to outline the scope of work for our International Meeting.

COMMITTEE ON INCORPORATION.

C. P. Lyman, *Ch'n*, Wm. Dougherty, W. J. Coates.

LOCAL COMMITTEE OF ARRANGEMENTS FOR INTERNATIONAL CONGRESS.

S. S. Baker, *Ch'n*, R. J. Withers, G. W. Pope.

VETERINARY EDUCATION.

A. Liautard, *Ch'n*, M. Stalker, C. P. Lyman.

TUBERCULOSIS COMMITTEE.

A. W. Clement, *Ch'n*, Leonard Pearson, Austin Peters.

ANIMAL FOOD.

D. E. Salmon, *Ch'n*, Olof Schwartzkopf, C. A. Cary.

HONORARY MEMBERS.

R. S. Huidekoper, *Ch'n*, A. Liautard, Leonard Pearson.

RESIDENT STATE SECRETARIES.

C. A. Cary, Alabama,	Wm. Jopling, Michigan,
M. A. Piche, Arizona,	C. C. Lyford, Minnesota,
F. A. Nief, California,	John S. Meyer, Missouri,
Harry E. Bates, Connecticut,	J. P. Turner, Nebraska,
J. D. Hinebauch, N. Dakota,	W. H. Lowe, New Jersey,
D. B. McCapes, S. Dakota,	W. T. Russell, New Hampshire,
H. P. Eves, Delaware,	E. B. Ackerman, New York,
F. L. Kilborne, Wash'gton, D. C.,	G. E. Griffin, Oklahoma Ter.,
G. W. Pope, Illinois,	Neil B. Jones, Ohio,
T. B. Pote, Indiana,	James A. Waugh, Pennsylvania,
W. B. Niles, Iowa,	J. A. McLaughlin, R. I.,
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H. H. Choate, Maine,	John A. Myers, Virginia,
G. C. Faville, Maryland,	J. W. Schiebler, Tennessee,
L. H. Howard, Massachusetts,	S. B. Nelson, Washington,
E. D. Roberts, Wisconsin.	

FOREIGN CORRESPONDING SECRETARIES.

Wyatt Johnston, Canada,	Wm. Jakeman, Halifax, N. S.,
J. H. Frinck, New Brunswick,	C. F. Douglas, Jamaica.

LIST OF MEMBERS—1863-93.

* Deceased.

† Dropped.

‡ Resigned.

§ Expelled.

ELECTED

- 1891 Ackerman, E. B., 278 Monroe St., Brooklyn, N. Y.
- 1889 Adair, H. B., 407 Wyandotte St., Kansas City, Missouri.
- †1885 Agersborg, G. S., Vermillion, Dakota. Dropped 1890.
- 1884 Alderman, H. L., East Lexington, Massachusetts.
- 1884 Allen, F. S., 800 N. 17th St., Philadelphia, Pa.
- 1890 Ambler, H. B., 420 Third Ave., New York City, N. Y.
- †1888 Anderson, James, New York City, N. Y. Dropped 1889.
- 1892 Archibald, R. A., Sacramento, California.
- 1890 Armstrong, T. L., Indianapolis, Indiana.
- 1892 Ashe, F. W., 137 26th St., Chicago, Illinois.
- 1889 Atchison, S., 987 Herkimer St., Brooklyn, N. Y.
- *1886 Atkinson, V. T., 563 Milwaukee St., Milwaukee, Wis. Died 1892.
- 1882 Atwood, H. C., Brockton, Massachusetts.
- 1887 Autenreith, Joseph, 780 West Newark Ave., Jersey City, N. J.

- 1880 Bailey, George H., 1 Pine St., Portland, Maine.
- 1892 Bachman, E. D., Chester, Orange County, N. Y.
- 1890 Baker, S. S., 901 Jackson Boulevard, Chicago, Illinois.
- 1890 Baker, A. H., 145 Michigan Ave., Chicago, Illinois.
- 1892 Baker, W. L., 19 Port Watson St., Cortland, N. Y.
- 1892 Balmer, William M., 23 Ellsworth Ave., Cambridge, Massachusetts.
- 1863 Banister, W., New York.
- 1892 Barnett, Otis, Edwardsville, Illinois.
- †1890 Barnes, A. S., Maquoketa, Iowa. Dropped 1892.
- 1887 Barron, Thomas F., 1050 Argyle Ave., Baltimore, Maryland.
- 1890 Bates, Harry E., 8 River St., Norwalk, Connecticut.
- 1884 Bath, H. W., New Brighton, Staten Island, N. Y.
- 1892 Batten, E. C., East Orange, N. J.
- 1892 Bear, Benjamin S. J., York, Pa.
- †1887 Beckett, E. C., 549 Albany St., Boston, Massachusetts. Dropped 1890; reinstated 1892.
- †1888 Beckley, E. M., Meriden, Connecticut. Dropped 1891.
- 1890 Bell, R. R., Seventh Ave. and Union St., Brooklyn, N. Y.
- †1875 Bell, L. C., New York. Dropped 1883.
- 1892 Bell, John A., 58 Court St., Watertown, N. Y.
- 1891 Berkmeier, William H., 320 W. 117th St., New York City, N. Y.
- 1884 Berns, George H., 74 Adams St., Brooklyn, N. Y.

ELECTED

- 1891 Bigelow, Alf., Norwood, Massachusetts.
 ‡1880 Billings, F. S., Chicago, Illinois. Expelled 1890.
 1889 Birch, William A., 1506 Frankford Road, Philadelphia, Pa.
 1886 Birdsall, Theodore, 159 Crosby St., New York City, N. Y.
 1864 Birney, C. H., New York.
 1881 Blackwood, Thomas, 2000 Washington St., Boston, Massachusetts.
 1875 Blakely, R. P., Syracuse, N. Y.
 1887 Bland, Thomas, Waterbury, Connecticut.
 1887 Blank, C. J., 104 East Eagle St., Buffalo, N. Y.
 1888 Bond, John P., 261 Huron St., Toronto, Canada.
 1892 Borden, C. R., 115 Broadway, Taunton, Massachusetts.
 *1863 Bowler, G. W., Ohio. Died —.
 1890 Bown, T. A., Chariton, Iowa.
 †1880 Boyd, H. B., New Rochelle, N. Y. Dropped 1892.
 †1878 Brackin, J. A., Pittsfield, Massachusetts. Dropped 1883.
 1863 Brandt, Louis, New York.
 1888 Breakell, J. A., Cross River, West County, N. Y.
 1887 Breed, C. S., Cor. Tremont and Appleton Sts., Boston, Massachusetts.
 1891 Brenton, S., 85 5th St., Detroit, Michigan.
 1890 Breslin, D. S., 94 Adams St., Brooklyn, N. Y.
 1883 Bretherton, W. C., 270 W. 126th St., New York City, N. Y.
 1887 Bridge, Francis, 228 N. 53d St., Philadelphia, Pa.
 *1888 Bridges, George, Norwalk, Connecticut. Died 1891.
 1892 Brooks, F. E., 207 Market St., Paterson, N. J.
 *1885 Brown, A. L., 35 Summer St., Stamford, Connecticut. Died 1887.
 1892 Brown, John E., Oskaloosa, Iowa.
 1889 Brownell, W. H., Porter's Stables, Brockton, Massachusetts.
 1876 Bryden, W., 36 Sudbury St., Boston, Massachusetts.
 1890 Buckley, Thomas M., 37 Hicks St., Brooklyn, N. Y.
 1863 Budd, A. C., New Jersey.
 †1863 Budd, I. F., New Jersey. Dropped 1883.
 1892 Budd, T. Earle, 81 Centre St., Woodbury, N. J.
 †1881 Bunker, Madison, Newton, Massachusetts. Dropped 1891; reinstated 1892.
 1863 Burden, Charles, 210 E. 52d St., New York City, N. Y.
 1884 Burget, Eugene, 840 Greenwich St., New York City, N. Y.
 1892 Burr, Alexander, Brighton, Massachusetts.
 1881 Burt, W. W., Providence, R. I.
 1892 Burt, Walter L., 26 Tabor Ave., Providence, R. I.
 †1881 Bushman, Joseph C., Washington, D. C. Dropped 1890.
 *1863 Busteed, John, New York City, N. Y. Died —.
 1887 Butler, Tait S., Agricultural College, Mississippi.
 1892 Butler, J. S., 509 Hennipen Ave., Minneapolis, Minnesota.

 †1884 Campbell, L. C., Philadelphia, Pa. Dropped 1890.
 1892 Carrick, Charles, McKeesport, Pa.
 1890 Cary, C. A., Auburn, Alabama.
 1890 Casewell, John, 625 W. Madison St., Chicago, Illinois.

ELECTED

- 1892 Chaffee, F. K., Lee, Massachusetts.
 1892 Chase, J. M., Seneca Falls, N. Y.
 1892 Cherry, J. M., St. Joseph, Missouri.
 1892 Choate, H. H., Lewiston, Maine.
 †1889 Churchill, R. T., North Bergen, N. J. Dropped 1891.
 †1889 Claris, John T., 627 Clinton St., Buffalo, N. Y. Resigned 1892.
 1884 Clement, A. W., 210 St. Paul St., Baltimore, Maryland.
 1892 Cloud, J. E., Richmond, Indiana.
 1877 Coates, W. J., 141 W. 54th St., New York City, N. Y.
 1881 Cochran, D. W., 15 Vestry St., New York City, N. Y.
 †1876 Colburn, C. W. Dedham, Massachusetts. Dropped 1890.
 †1880 Colson, P. Z., Mobile, Alabama. Dropped 1890.
 1890 Conoway, John W., Columbia, Missouri.
 1892 Conrow, A. E., Moorestown, N. J.
 1863 Cooper, F.
 *1863 Copeman, A. S., Utica, N. Y. Died —.
 1876 Corlies, J. C., Newark, N. J.
 †1875 Cosgrove, J. B., Worcester, Massachusetts. Dropped 1890.
 *1880 Cowhey, T. C., St. Louis, Missouri. Died 1885.
 †1883 Crane, L. M., New York City, N. Y. Dropped 1890.
 1889 Crego, Porte-Aurora, Illinois.
 Creighton, C.
 1863 Critcherson, W. D., 483 4th Ave., New York City, N. Y.
 1876 Crowley, C. W., 2912 Sheridan Ave., St. Louis, Missouri.
 †1888 Cuff, W. E., New York City, N. Y. Dropped 1892.
 †1889 Culbert, J. S., Portland, Indiana. Dropped 1891.
 1864 Curran, R. J., Pennsylvania.
 1888 Curtice, Cooper, Moravia, N. Y.
 *1863 Curtis, R. H., Brooklyn, N. Y. Died 1869.
 1892 Curry, W. W., Hackensack, N. J.

 †1891 Daniels, W. D., Cardington, Ohio. Dropped 1892.
 1892 Davitt, M. H., Washington D. C.
 1892 Darling, A., St. Louis, Mo.
 1892 DeClyne, Theodore, New Durham, Hudson County, N. J.
 1892 DeRonde, J. D., Nyack, N. Y.
 †1884 Detmers, H. J., Champaign, Illinois. Dropped 1890.
 †1882 Devoe, W. S., 47 Montgomery St., Jersey City, N. J. Dropped 1890;
 reinstated 1892.
 1891 Dews, H. H., New Bedford, Massachusetts.
 1863 Dilts, Jacob, New Jersey.
 †1865 Dimond, William, Salt Lake City, Utah. Dropped 1890.
 1881 Dixon, D. J., 366 Washington St., Hoboken, N. J.
 1892 Dodge, William H., Leominster, Massachusetts.
 1891 Donnelly, J. T., Astoria, Long Island, N. Y.
 1882 Dougherty, John, 54 Clinton St., New York City, N. Y.
 1874 Dougherty, William, 1035 Cathedral St., Baltimore, Maryland.
 1892 Douglas, Charles F., 26 East St., Kingston, Jamaica.

ELECTED

- 1882 Duane, John, New York City, N. Y.
 1892 Dunn, R. A., Titusville, Pa.
 1892 Dwinal, C. Frank, Mechanics' Falls, Maine.
 †1885 Dyer, Charles K., Baltimore, Maryland. Dropped 1892.
- 1892 Ebbitt, Richard, 420 S. 19th St., Omaha, Nebraska.
 1890 Edwards, F. H. P., Iowa City, Iowa.
 1892 Edwards, Warren T., Downingtown, Pennsylvania.
 1892 Ellis, Robert W., 468 W. 150th St., New York City, N. Y.
 1892 Eliot, H. W., 800 Broad St., Newark, N. J.
 1888 Emerson, Daniel, 28 Farrar St., Lynn, Massachusetts.
 1889 Eves, H. P., 507 W. 9th St., Wilmington, Delaware.
 1863 Essenwein, J. C., Philadelphia, Pa.
- 1890 Fagan, Gulian C., 232 E. 116th St., New York City, N. Y.
 1888 Fair, J. D., Berlin, Ohio.
 1863 Farley, Richard, Massachusetts.
 †1879 Farley, O. C., Boston, Massachusetts. Dropped 1883.
 1892 Farrington, A. M., Washington, D. C.
 †1887 Farnsworth, G. H., Rutland, Vermont. Dropped 1890.
 1886 Faust, J., 209 Union St., Poughkeepsie, N. Y.
 1888 Faville, G. C., 210 St. Paul St., Baltimore, Maryland.
 †1874 Fernsler, Philip, Pennsylvania. Dropped 1876.
 †1878 Field, S. S., New York City, N. Y. Dropped 1890.
 †1873 Finley, R. W., New York City, N. Y. Dropped 1875.
 1863 Flagg, O. H., New Bedford, Massachusetts.
 *1878 Fogg, J. C., Boston, Massachusetts. Died 1890.
 †1880 Foote, H. T., New York City, N. Y. Dropped 1890.
 1892 Forbes, John, South Omaha, Nebraska.
 1878 Force, J. C., Newark, N. J.
 1892 Formad, Robert, 1008 N. 6th St., Philadelphia, Pa.
 1892 Foss, George B., Boston, Massachusetts.
 †1888 Foy, J. J., New York City, N. Y. Dropped 1890.
 1883 Frinck, J. H., St. John, New Brunswick.
- 1892 Gadsden, John W., 128 N. 10th St., Philadelphia, Pa.
 1892 Gage, F. H., New York City, N. Y.
 †1883 Gardner, J. E., Hartford, Connecticut. Dropped 1891.
 †1880 Gerth, Jr., J. C. Newark, N. J. Dropped 1890.
 1892 Giffen, Thomas, 125 W. 56th St., New York City, N. Y.
 1884 Gilbert, E. G., Pottstown, Pa.
 1888 Gill, H. D., 896 Bedford Ave., Brooklyn, N. Y.
 1883 Glass, Alexander, 2125 Sansom St., Philadelphia, Pa.
 1883 Goentner, Charles T., Bryn Mawr, Montgomery County, Pa.
 1890 Grange, E. A. A., Agricultural College, Michigan.
 *1863 Grice, C. C., New York. Died —.
 1890 Griffin, G. E., 5th Cavalry, Fort Reno, Oklahoma Territory.
 †1889 Grimshaw, G., Ontario, Canada. Dropped 1891.
 1892 Gunning, Thomas J., Neponset, Bureau County, Illinois.

ELECTED

- 1877 Hall, C. H., Hotel Holt, 14 Carver St., Boston, Mass.
 1892 Hall, John, Falls City, Nebraska.
 †1880 Hall, Ralph, New York City, N. Y. Dropped 1884.
 †1881 Hanshew, E., Brooklyn, N. Y. Dropped 1890.
 †1883 Hanshew, J. F., Brooklyn, N. Y. Dropped 1890.
 1892 Hanson, H. D., 160 Eldridge St., New York City, N. Y.
 1888 Harger, S. J. J., N. E. cor. 20th and Race Sts., Philadelphia, Pa.
 †1887 Harris, William N., New York City, N. Y. Dropped 1890.
 1881 Harrison, Ralph, cor. Scotia and Bothnia Sts., Boston, Massachusetts.
 1892 Harrison, W. F., Bloomfield, Essex County, N. J.
 1889 Hartman, G. R., 2130 N. 4th St., Philadelphia, Pa.
 1888 Hassall, Albert, 1115 Carrollton Ave., Baltimore, Maryland.
 1890 Hawkins, J., 303 3d St., Detroit, Michigan.
 1885 Hawks, J. W., 10 Market St., Newark, N. J.
 †1889 Herbert, F. C., Marlboro, N. J. Dropped 1891.
 1874 Herr, B.
 1879 Herr, Thomas J., New York City, N. Y.
 1890 Hickman, R. W., 509 W. 59th St., New York City, N. Y.
 1863 Higgins, J. C., New Jersey.
 1889 Hill, A. G., 110 Putnam St., East Boston, Massachusetts.
 1891 Hill, Joseph G., Sennett, N. Y.
 1892 Hinebauch, J. D., Fargo, North Dakota.
 1889 Hinkley, Nelson P., 395 Ellicot St., Buffalo, N. Y.
 †1890 Hinman, W. J., Winnipeg, Manitoba. Dropped 1892.
 1888 Hitchcock, W. A., Malden, Massachusetts.
 †1889 Hitchings, W. H., Somerville, Massachusetts. Dropped 1891.
 1888 Hoffmann, D. R., 109 S. Arlington Ave., Baltimore, Maryland.
 †1876 Holcombe, A. A., Plainfield, N. J. Dropped 1886.
 1892 Holden, H. E., Springfield, Massachusetts.
 1885 Hollingsworth, W. G., 45 Catharine St. Utica, N. Y.
 1890 Hollingsworth, C. E., La Salle, Illinois.
 1892 Honan, J. H., Delphi, Indiana.
 1892 Hoover, Lee, Richmond, Indiana.
 1873 Hopkins, J. D., 32 Franklin St., Newark, N. J.
 1892 Hopper, John B., Ridgewood, N. J.
 1883 Hoskins, W. Horace, 12 S. 37th St., Philadelphia, Pa.
 1882 Howard, L. H., 1440 Washington St., Boston, Massachusetts.
 1884 Howe, William R., Dayton, Ohio.
 1892 Huelsen, J., Abattoir, Jersey City, N. J.
 1890 Hughes, Joseph, 2537 State St., Chicago, Illinois.
 1890 Huhne, J. A., Rondout, N. Y.
 1884 Huidekoper, R. S., 129 W. 52d St., New York City, N. Y.
 †1889 Hummel, A. L., 224 S. 16th St., Philadelphia, Pa. Resigned 1890.
 †1885 Humphrey, W. P., Elizabeth, N. J. Dropped 1890.
 1863 Humphrey, Sil., New Jersey.
 1890 Hunter, S. L., Fort Leavenworth, Kansas.
 1883 Huntington, F. W., Woodford, Maine.

ELECTED

- 1892 Ingalls, E. B., Mohawk, N. Y.
- †1890 Jackson, C. C., Marshall, Missouri. Dropped 1892.
 1888 Jackson, J. C., 46 Woodworth Ave., Yonkers, N. Y.
 1886 Jacobus, J. H., 547 W. 35th St., New York City, N. Y.
 1892 Jakeman, William, Halifax, Nova Scotia.
 1885 James, H. F., 2627 Olive St., St. Louis, Missouri.
 1884 James, V. L., Cooperstown, N. Y.
 1892 Jarman, G. Allan, Chestertown, Maryland.
- †1889 Jasme, A., Savannah, Georgia. Dropped 1891.
 ‡1863 Jennings, R., Bordentown, N. J. Expelled 1866.
 1890 Johnson, George A., Room 47 Evans' Block, Sioux City, Iowa.
 1888 Johnson, S. K., 117 W. 25th St., New York City, N. Y.
 1892 Johnston, Wyatt, 99 Union Ave., Montreal, Canada.
- †1890 Johnstone, J., St. Joseph, Missouri. Dropped 1892.
 ‡1887 Jones, R. C., Port Jefferson, Long Island, N. Y. Expelled 1889.
 1892 Jones, Neil B., Chillicothe, Ohio.
 1892 Jopling, William, Owosso, Michigan.
- 1883 Kay, R., 365 W. 36th St., New York City, N. Y.
- †1889 Kelly, W. H., Albany, N. Y. Dropped 1890.
 †1882 Kemp, J. L., Brooklyn, N. Y. Dropped 1890.
 1890 Kennedy, J. T., West Union, Iowa.
 1891 Kenney, John A., 408 E. 13th St., New York City, N. Y.
- *1890 Kidd, J. L., 101 E. Main St., Lexington, Kentucky. Died 1892.
 1892 Kiernan, P. F., Jefferson Barracks, Missouri.
 1890 Kilborne, F. L., Department of Agriculture, Washington, D. C.
 Kleindoff, William, Middletown, Pa.
- †1888 Klicker, H. C., Clarence, N. Y. Dropped 1891.
 †1890 Klutts, L. M., Clinton, Missouri. Dropped 1892.
 1891 Knowles, M. E., Riverside, Montana.
 1886 Kooker, W. S., 457 N. 4th St., Philadelphia, Pa.
 1892 Krowl, I. N., Passaic, N. J.
- 1891 Labaw, W. L., 50 Village St., Boston, Massachusetts.
- †1876 Laidlaw, R., Albany, N. Y. Dropped 1890.
 1892 Lambert, H. D., Salem, Massachusetts.
- †1887 Lamberton, Fred., New London, Connecticut. Dropped 1891.
 1890 Lanigon, O. J., Wenona, Illinois.
 1884 Langtry, William, Muncie, Indiana.
 1863 Large, A., New York.
- †1876 Law, James, Ithaca, N. Y. Dropped 1880.
 †1865 Lawrence, Henry. Dropped 1885.
- *1889 Lathrop, G. A., 77 Collier St., Binghampton, N. Y. Died 1890.
 1886 Leatherman, A. S., Clinton, N. J.
 1887 Lee, D. D., 547 Albany St., Boston, Massachusetts.
 1882 Leighton, J. A., 505 W. 42d St., New York City, N. Y.
 1892 Leis, Robert L., Newark, N. J.

ELECTED

- 1889 Lemay, D., Fort Riley, Kansas.
 1892 Leonard, H. F., 781 Tremont St., Boston, Massachusetts.
 1890 Letts, Richard R., 34 Newark St., Hoboken, N. J.
 1863 Liautard, Alexander, 141 W. 54th St., New York City, N. Y.
 1892 Lintz, Charles, Chester, Pa.
 1892 Loblein, E. L., New Brunswick, N. J.
 *1875 Lockhart, A., 124 E. 13th St., New York City, N. Y. Died 1890.
 1868 Lombard, J. L., Boston, Massachusetts.
 1892 Lord, William, United States Hotel, Portland, Maine.
 1886 Lowe, W. H., 190 Ellison St., Paterson, N. J.
 1892 Lowe, J. P., 190 Ellison St., Paterson, N. J.
 1889 Lusson, L. O., Ardmore, Pa.
 1884 Lyford, C. C., 821 Third Ave., South Minneapolis, Minnesota.
 1875 Lyman, C. P., 50 Village St., Boston, Massachusetts.

 1890 McCapes, D. B., Vermilion, South Dakota.
 1863 McCoun, William, J., Long Island, N. Y.
 ‡1863 McClure, Robert, Philadelphia, Pa. Expelled 1865.
 1892 McDonough, James, 617 Bloomfield Ave., Montclair, N. J.
 1876 McInnes, B., Charleston, S. C.
 1892 McIntosh, A. H., 113 Washington St., Morristown, N. J.
 1888 McKee, James, 10 Thompson St., Stapleton, Staten Island, N. Y.
 1891 McKenna, E. P., 101 Main St., Woburn, Massachusetts.
 1891 McKinney, W. H., Geneseo, Illinois.
 1885 McLaughlin, J. A., 159 Benefit St., Providence, R. I.
 †1878 McLaughlin, J. M., Lynn, Massachusetts. Dropped 1883.
 1887 McLean, C. C., 1001 Water St., Meadville, Pa.
 1876 McLean, L., 14 and 16 Nevins St., Brooklyn, N. Y.
 1879 McLean, R. A., 14 and 16 Nevins St., Brooklyn St.
 1883 McLellan, E. A., 144 Noble St., Bridgeport Connecticut.
 1882 McLellan, F. W., 144 Noble St., Bridgeport, Connecticut.
 1892 McLeod, E. J., 1149 Niagara St., Buffalo, N. Y.
 1890 McMurdo, C. D., Fort Sill, Oklahoma Territory.
 1891 McNeil, James C., 26 4th St., Pittsburg, Pa.
 †1881 McNicol, J. E., New York City, N. Y. Dropped 1890.
 1892 Machan, Alexander, 69 River St., Paterson, N. J.
 1889 Mackey, C. A., 202 E. 81st St., New York City, N. Y.
 1892 Mahanoy, F. X., 50 Village St., Boston, Massachusetts.
 1878 Malloy, J. C.
 †1889 Maloney, Thomas E., Central Falls, R. I. Dropped 1891.
 1863 Mankias, W. R., New Jersey.
 †1886 Marshall, Alexander, Massachusetts. Dropped 1890.
 1883 Martin, A. F.
 †1885 Martin, Charles, Evansville, Indiana. Dropped 1889.
 1887 Martinet, W. H., 2140 E. Hoffman, St., Baltimore, Maryland.
 †1889 Mathues, Samuel, Elam, Delaware County, Pa. Dropped 1890.
 1891 Mayo, N. S., Manhattan, Kansas.
 1891 Meisner, H. A., 1133 Aisquith St., Baltimore, Maryland.

ELECTED

- 1863 Mellor, G., Philadelphia, Pa.
 1888 Melvin, A. D., 4122 Halsted St., Chicago, Illinois.
 1888 Mercer, E. R., Montclair, N. J.
 1877 Meyer, Sr. J. C., 326 Plum St., Cincinnati, Ohio.
 1875 Meyer, Jr., J. C., 379-81 Walnut St., Cincinnati, Ohio.
 1890 Meyer, John S., 513 Edmond St., St. Joseph, Missouri.
 1874 Michener, Charles B., Dept. of Agriculture, Washington, D. C.
 1892 Michener, Mayhew, E. Colmar, Montgomery County, Pa.
 1888 Middleton, William D., Fishkill-on-the-Hudson, N. Y.
 †1886 Miles, William, Charlestown, Illinois. Dropped 1890.
 1884 Miles, Isaac, Charlestown, Illinois.
 1891 Millar, John J., Sioux City, Iowa
 1879 Miller, William B. E., 527 Penn St., Camden, N. J.
 1892 Miller, John E., Christianburg, Virginia.
 1892 Mills, C. C., Mt. Palatine, Putnam County, Illinois.
 †1885 Mitchell, William R., New York City, N. Y. Dropped 1890.
 †1888 Morice, Jr., J., New Orleans, Louisiana. Dropped 1891.
 1892 Morris, Claude D., Green Ave. and Broadway, Brooklyn, N. Y.
 1890 Morrison, R. R., White Plains, New York.
 *1882 Moulton, Charles L., Washington, D. C. Died 1889.
 1887 Moyer, O. R., Mt. Carroll, Illinois.
 †1887 Moyer, T. W., Easton, Pa. Dropped 1889.
 *1889 Moyer, S. E., Hilltown, Pa. Died 1890.
 1863 Mulligan, James, New York.
 1878 Murphy, William, Cambridge, Massachusetts.
 1884 Murray, A. J., New York City, N. Y.
 *1886 Mustoe, J. F., 217 7th St., Brooklyn, E. D., N. Y. Died 1893.
 1890 Myers, John A., Harrisonburg, Rockingham County, Va.

 1890 Neher, Herbert, 350 W. 48th St., New York City, N. Y.
 1890 Nelson, S. B., Spokane Falls, Washington.
 1891 Nesbitt, Edward J., 16 Grand St., Poughkeepsie, N. Y.
 1888 Newman, Philip, 292 Hayward St., Brooklyn, N. Y.
 1892 Nief, F. A., 1342 Bush St., San Francisco, California.
 1891 Niles, E. P., Blacksburg, Virginia.
 1891 Niles, W. B., Ames, Iowa.
 †1863 Nostrand, E., New York City, N. Y. Dropped 1879.
 *1871 Nostrand, P., New York City, N. Y. Died 1879.
 1892 Nunan, William L., Lansdowne, Pa.

 1890 O'Brien, F. W., Hannibal, Missouri.
 †1887 O'Connell, Maurice, Holyoke, Massachusetts. Dropped 1891.
 1890 Ogle, Jr., Joseph, Greenport, N. Y.
 1886 Ogle, Ralph, 312 W. 59th St., New York City, N. Y.
 1892 Ogden, E. R., Orange, N. J.
 1889 Osborne, E. M., East Hampton, Long Island, N. Y.
 1881 Osgood, F. H., 50 Village St., Boston, Massachusetts.
 †1880 O'Sullivan, William J., New Haven, Connecticut. Dropped 1883.

ELECTED

- †1885 Otto, William J., New York City, N. Y. Dropped 1890.
 †1889 Orlopp, B. G., Indianapolis, Indiana. Dropped 1891.

- 1888 Paaren, N. H., 4122 Halsted St., Chicago, Illinois.
 †1889 Page, I. F., Manchester, Vermont. Dropped 1891.
 1891 Paige, James B., Amherst, Massachusetts.
 *1863 Palmer, E. H. Died 1864.
 1886 Paquin, Paul, Battle Creek, Michigan.
 1892 Parker, John M., Haverhill, Massachusetts.
 1889 Parsons, E. A., 134 W. 39th St., New York City, N. Y.
 †1887 Peabody, C. H., Providence, Rhode Island. Dropped 1891.
 †1889 Pearson, G. G., Philadelphia, Pa. Dropped 1891.
 1892 Pearson, Leonard, 2200 Pine St., Philadelphia, Pa.
 1883 Pendry, W. H., 351 St. Mark's Place, Brooklyn, N. Y.
 1877 Penniman, G. P., Exchange St., Worcester, Massachusetts.
 1863 Penniman, J., Exchange St., Worcester, Massachusetts.
 1889 Perry, Charles H., 47 Montgomery St., Jersey City, N. J.
 1873 Peters, Peter, New York City, N. Y.
 1883 Peters, Austin, 35 Congress St., Boston, Massachusetts.
 1891 Peterson, W. E., 509 Main St., Waltham, Massachusetts.
 1863 Phillips, A., New Jersey.
 1863 Phillips, Jacob, New Jersey.
 1890 Phillips, J. M., 3146-48 Easton Ave., St. Louis, Missouri.
 1890 Phillips, S. E., Wichita, Kansas.
 1890 Piatt, H. B., 3710 N. 9th St., St. Louis, Missouri.
 1890 Piche, M. A., Fort Grant, Arizona.
 1883 Pierce, Benjamin D., Springfield, Massachusetts.
 †1876 Plageman, L. V., Brooklyn, N. Y. Dropped 1883.
 †1890 Plummer, Alexander, Wyoming. Dropped 1892.
 1890 Pope, G. W., 2537 State St., Chicago, Illinois.
 1892 Pote, T. B., Mt. Vernon, Indiana.
 1885 Prophett, W. H., 59 Fairfield Ave., Bridgeport, Connecticut.
 †1889 Prothero, W. B., Horton P. O., Pa. Expelled 1890.
 †1890 Price, R., St. Paul, Minnesota. Dropped 1892.
 1890 Purcell, C. W., Biddeford, Maine.

- †1890 Quitman, P., Chicago, Illinois. Dropped 1892.

- 1890 Ramsey, A. E., Louisiana, Missouri.
 1885 Rayner, James B., West Chester, Pa.
 1885 Rayner, T. B., Chestnut Hill, Philadelphia, Pa.
 1891 Reynolds, M. H., Keosauqua, Iowa.
 †1883 Rice, F. E., Hartford, Connecticut. Dropped 1890.
 †1885 Richards, S. L., Salt Lake City, Utah. Dropped 1891.
 1890 Richards, W. H., Emporia, Kansas.
 1889 Richards, Robert, New York City, N. Y.
 1863 Ripley, E. F., Maine.
 †1889 Roberts, George H., East Shelby, N. Y. Dropped 1891.

ELECTED

- 1891 Roberts, E. D., Janesville, Wisconsin.
 1888 Robertson, A. K., Green Ave. and Broadway, Brooklyn, N. Y.
 1868 Robertson, J. L., 409 9th Ave., New York City, N. Y.
 1889 Robinson, W. H., 26 Pleasant St., Charleston, Massachusetts.
 †1888 Roche, E. W., Boston, Massachusetts. Dropped 1891.
 1892 Rogers, Howard P., Allston, Boston, Massachusetts.
 †1879 Rogers, Thomas B., Newark, N. J. Dropped 1883.
 1878 Rose, A. H., Littleton, Massachusetts.
 1887 Rose, William, Stapleton, Staten Island, N. Y.
 1880 Rose, William H., 18 Broadway, New York City, N. Y.
 1884 Ross, E. C., 278 Elm St., New Haven, Connecticut.
 1890 Rouif, A., 317 W. Channing St., St. Louis, Missouri.
 †1884 Rowland, E. W., Monroe, Wisconsin. Dropped 1891.
 †1884 Rowland, Ward B., Pasadena, California. Dropped 1891.
 1885 Rowland, H. W., 34 Nelson Place, Newark, N. J.
 1889 Russell, F. L., Orono, Maine.
 1889 Russell, W. T., Nashua, N. H.
 1881 Ryan, J. F., 401 Illinois St., Chicago, Illinois.
 †1890 Rutherford, John D., Rock Island, Illinois. Dropped 1892.
 †1884 Ryder, J. E., Long Island, N. Y. Dropped 1890.
 †1884 Ryder, J. F., Rondout, N. Y. Dropped 1890.

 †1886 Sallade, J. W., Pottsville, Pa. Dropped 1891.
 1887 Salmon, D. E., Bureau of Animal Industry, Washington, D. C.
 *1863 Saunders, William, New York. Dropped 1884.
 1882 Saunders, Fred., Lynn, Massachusetts.
 1871 Saunders, R. J., Salem, Massachusetts.
 1876 Saunders, J. S., American Stables, Sudbury St., Boston, Mass.
 1890 Sayre, C. E., 3725 Cottage Grove Ave., Chicago, Ill.
 ‡1884 Schaffer, D. M., New Castle, Indiana. Expelled 1888.
 †1884 Schaffler, Charles, Philadelphia, Pa. Dropped 1890.
 1885 Schiebler, J. W., 312 3d St., Memphis, Tennessee.
 †1878 Schmidt, W. G., Newark, N. J. Dropped 1883.
 1892 Schoenleber, F. S., Morris, Illinois.
 †1890 Schrieber, A. F., Philadelphia, Pa. Dropped 1892.
 1888 Schroeder, E. C. H., Washington, D. C.
 1890 Schwartzkopff, Olof, 637 Cedar St., St. Paul, Minnesota.
 1892 Seale, J. H., Spokane Falls, Washington.
 1887 Sellers, A. T., 312 S. 5th St., Camden, N. J.
 1890 Shaw, Walter, Dayton, Ohio.
 1892 Sheldon, A. J., 141 W. 54th St., New York City, N. Y.
 1883 Sherk, Andrew, Newark, N. J.
 1882 Sherman, W. A., 98 Pawtucket St., Lowell, Massachusetts.
 1892 Sherwood, Thomas G., 854 Seventh Ave., New York City, N. Y.
 †1884 Simmons, William T., Boston, Massachusetts. Dropped 1890.
 †1883 Skally, J. M., Boston, Massachusetts. Dropped 1890.
 1892 Smith, D. E., Great Neck, Queens County, Long Island, N. Y.
 1892 Smith, Theobald, 1527 O St., Washington, D. C.

ELECTED

- 1890 Sollberger, R. J., 1334 S. 7th St., St. Louis, Missouri.
 1890 Spangler, J. S., Aurora, Illinois.
 ‡1885 Spranklin, T. W., Baltimore, Maryland. Expelled 1889.
 1892 Stalker, M., Ames, Iowa.
 1889 Stanwood, R. E., Freehold, N. J.
 1892 Steddom, R. P., Galesburg, Illinois.
 1890 Stewart, S., care Swift & Co., Kansas City, Missouri.
 1863 Stickney, J. H., American Stables, Sudbury St., Boston, Mass.
 1892 Stinson, William, 59 Blossom St., Chelsea, Massachusetts.
 1875 Stocker, C. H., Salem, Massachusetts.
 1892 Stockwell, G. Archie, E. Detroit, Michigan.
 1891 Stony, R. W., Princeton, Illinois.
 1887 Strange, A., 322 W. 15th St., New York City, N. Y.
 1892 Stringer, N. I., Fairbury, Illinois.
 1892 Stull, C. M., South Bend, Indiana.
 1890 Swedberg, Alf., 1402 G St., N. W., Washington, D. C.
- *1863 Thayer, E. F., West Newton, Massachusetts. Died 1889.
 †1890 Thomas, L. A., Atlantic, Iowa. Dropped 1892.
 1890 Thompson, A. J., Terre Haute, Indiana.
 †1890 Tillie, John, Muscatine, Iowa. Dropped 1892.
 1882 Travers, Frank, Rhinebeck, N. Y.
 1875 Travers, E., Hudson, N. Y.
 1885 Trumbower, M. R., 502 3d Ave., Sterling, Illinois.
 †1888 Tucker, Richard L., Mount Holly, N. J. Dropped 1891.
 1891 Turner, J. P., Fort Niobrara, Nebraska.
 1887 Turner, Thomas J., Columbia, Missouri.
 1892 Turcot, Isadore, Minto, N. Dakota.
 1888 Tuttle, A. A., New Britain, Connecticut.
 *1890 Tye, F. M., Muncie, Indiana. Died 1891.
- 1889 Vander Roest, H., 315 Mulberry St., Newark, N. J.
 1887 Van Mater, George G., 354 Macon St., Brooklyn, N. Y.
 1890 Valerius, N. P., Watertown, Wisconsin.
 1872 Very, T. S., 82 Pitt St., Boston, Massachusetts.
 1884 Vogt, A. G., 103-105 Plane St., Newark, N. J.
 1892 Voorhees, E. R., Sommerville, N. J.
 1884 Vreeland, Hamilton.
- 1890 Walker, R. G., 20 S. Carpenter St., Chicago, Illinois.
 1890 Waller, H. N., Windom, Minnesota.
 1888 Walmer, E. S., 3227 M St., Georgetown, D. C.
 1887 Walrath, James A., 444 Jersey Ave., Jersey City, N. J.
 †1891 Walsh, William J., New York City, N. Y. Dropped 1891.
 1863 Walton, J. C., New Jersey.
 †1885 Walton, F. M., New York City, N. Y. Dropped 1890.
 †1889 Wappell, William, Pleasant Valley, Pa. Dropped 1891.
 1886 Warner, G. L., 117 W. 25th St., New York City, N. Y.

ELECTED

- 1886 Waters, E., 112 Ashland Place, Brooklyn, N. Y.
- 1890 Waugh, James A., 49 Race St., Allegheny City, Pa.
- 1886 Weber, S. E., Lancaster, Pa.
- 1890 Webster, R. G., Media, Pa.
- †1889 Weidner, Charles J., Hellertown, Pa. Dropped 1891.
- 1888 Wende, John, 1598 Main St., Buffalo, N. Y.
- 1892 Wende, Benjamin P., Milgrove, Erie County, Pa.
- †1887 Werner, G. W., Appleton City, Missouri. Dropped 1892.
- 1892 Wertz, William B., 4531 Lancaster Ave, Philadelphia, Pa.
- 1890 White, T. E., Sedalia, Missouri.
- 1892 Whitmore, N. P., Gardner, Illinois.
- 1888 Whitney, Harrison, 20 George St., New Haven, Connecticut.
- 1892 Wilkinson, F. C., Claremont, N. H.
- †1890 Williams, G. C., Dewitt, Iowa. Dropped 1892.
- 1884 Williams, W. L., Lafayette, Indiana.
- †1888 Williams, Charles, Philadelphia, Pa. Dropped 1890.
- †1885 Wilson, J. P., Hamilton, Ohio. Dropped 1891.
- †1889 Winant, Frank, Greenfield, N. Y. Dropped 1891.
- 1878 Winchester, J. F., Lawrence, Massachusetts.
- 1880 Wing, Edgar P.
- *1863 Wisdom, William A., Wilmington, Delaware. Died 1891.
- †1887 Winslow, K., Boston, Massachusetts. Dropped 1890.
- †1880 Winslow, Charles, Rockland, Massachusetts. Dropped 1890.
- 1890 Withers, R. J., 2537 State St., Chicago, Illinois.
- 1892 Wittpenn, J. N., 217 Whiton St., Jersey City, N. J.
- *1863 Wood, Robert. Lowell, Massachusetts. Died 1891.
- *1863 Wood, Charles M. Boston, Massachusetts. Died 1869.
- 1878 Wray, W. H., No. 7 Church Road, Upper Norwood, London, Eng.
- 1890 Wright, J. M., 2537 State St., Chicago, Illinois.

- †1885 Yokura, H. T., Tokio, Japan. Dropped 1891.
- †1888 Young, A. C., Salt Lake City, Utah. Dropped 1891.

- 1880 Zuill, W. L., 1526 Race St., Philadelphia, Pa.

REGULAR MEMBERS—1893.

ELECTED

- 1891 Ackerman, E. B., 278 Monroe St., Brooklyn, N. Y.
1889 Adair, H. B., 407 Wyandotte St., Kansas City, Missouri.
1884 Alderman, H. L., East Lexington, Massachusetts.
1884 Allen, F. S., 800 N. 17th St., Philadelphia, Pa.
1890 Ambler, H. B., 420 Third Ave., New York City, N. Y.
1892 Archibald, R. A., Sacramento, California.
1890 Armstrong, T. L., Indianapolis, Indiana.
1889 Atchison, S., 987 Herkimer St., Brooklyn, N. Y.
1882 Atwood, H. C., Brockton, Massachusetts.
1887 Autenreith, Joseph, 780 West Newark Ave., Jersey City, N. J.
- 1880 Bailey, George H., 1 Pine St., Portland, Maine.
1890 Baker, S. S., 901 Jackson Boulevard, Chicago, Illinois.
1890 Baker, A. H., 145 Michigan Ave., Chicago, Illinois.
1892 Baker, W. L., 19 Port Watson St., Cortland, N. Y.
1892 Balmer, William M., 23 Ellsworth Ave., Cambridge, Massachusetts.
1887 Barron, Thomas F., 1050 Argyle Ave., Baltimore, Maryland.
1890 Bates, Harry E., 8 River St., Norwalk, Connecticut.
1884 Bath, H. W., New Brighton, Staten Island, N. Y.
1887 Beckett, E. C., 549 Albany St., Boston, Massachusetts.
1890 Bell, R. R., Seventh Ave. and Union St., Brooklyn, N. Y.
1892 Bell, John A., 58 Court St., Watertown, N. Y.
1891 Berkmyer, William H., 320 W. 117th St., New York City, N. Y.
1884 Berns, George H., 74 Adams St., Brooklyn, N. Y.
1889 Birch, William A., 1506 Frankford Road, Philadelphia, Pa.
1886 Birdsall, Theodore, 159 Crosby St., New York City, N. Y.
1881 Blackwood, Thomas, 2000 Washington St., Boston, Massachusetts.
1887 Bland, Thomas, Waterbury, Connecticut.
1887 Blank, C. J., 104 East Eagle St., Buffalo, N. Y.
1888 Bond, John P., 261 Huron St., Toronto, Canada.
1892 Borden, C. R., 115 Broadway, Taunton, Massachusetts.
1890 Bown, T. A., Chariton, Iowa.
1888 Breakell, J. A., Cross River, West County, N. Y.
1887 Breed, C. S., Cor. Tremont and Appleton Sts., Boston, Massachusetts.
1891 Brenton, S., 35 5th St., Detroit, Michigan.
1883 Bretherton, W. C., 270 W. 126th St., New York City, N. Y.
1887 Bridge, Francis, 228 N. 53d St., Philadelphia, Pa.
1892 Brooks, F. E., 207 Market St., Paterson, N. J.
1889 Brownell, W. H., Porter's Stables, Brockton, Massachusetts.
1876 Bryden, W., 36 Sudbury St., Boston, Massachusetts.
1890 Buckley, Thomas M., 37 Hicks St., Brooklyn, N. Y.

ELECTED

- 1892 Budd, T. Earle, 81 Centre St., Woodbury, N. J.
 1881 Bunker, Madison, Newton, Massachusetts.
 1863 Burden, Charles, 210 E. 52d St., New York City, N. Y.
 1884 Burget, Eugene, 840 Greenwich St., New York City, N. Y.
 1892 Burt, Walter L., 26 Tabor Ave., Providence, R. I.
 1887 Butler, Tait S., Agricultural College, Mississippi.
 1892 Butler, J. S., 509 Hennipen Ave., Minneapolis, Minnesota.

 1890 Cary, C. A., Auburn, Alabama.
 1890 Casewell, John, 625 W. Madison St., Chicago, Illinois.
 1892 Chaffee, F. K., Lee, Massachusetts.
 1892 Chase, J. M., Seneca Falls, N. Y.
 1892 Choate, H. H., Lewiston, Maine.
 1884 Clement, A. W., 210 St. Paul St., Baltimore, Maryland.
 1877 Coates, W. J., 141 W. 54th St., New York City, N. Y.
 1881 Cochran, D. W., 15 Vestry St., New York City, N. Y.
 1890 Conoway, John W., Columbia, Missouri.
 1892 Conrow, A. E., Moorestown, N. J.
 1889 Crego, Porte, Aurora, Illinois.
 1863 Critcherson, W. D., 488 4th Ave., New York City, N. Y.
 1876 Crowley, C. W., 2912 Sheridan Ave., St. Louis, Missouri.
 1888 Curtice, Cooper, Moravia, N. Y.

 1892 DeClyne, Theodore, New Durham, Hudson County, N. J.
 1882 Devoe, W. S., 47 Montgomery St., Jersey City, N. J.
 1881 Dixon, D. J., 366 Washington St., Hoboken, N. J.
 1891 Donnelly, J. T., Astoria, Long Island, N. Y.
 1882 Dougherty, John, 54 Clinton St., New York City, N. Y.
 1874 Dougherty, William, 1035 Cathedral St., Baltimore, Maryland.
 1892 Douglas, Charles F., 26 East St., Kingston, Jamaica.
 1892 Dwinal, C. Frank, Mechanics' Falls, Maine.

 1892 Ebbitt, Richard, 420 S. 19th St., Omaha, Nebraska.
 1890 Edwards, F. H. P., Iowa City, Iowa.
 1888 Emerson, Daniel, 23 Farrar St., Lynn, Massachusetts.
 1889 Eves, H. P., 507 W. 9th St., Wilmington, Delaware.

 1890 Fagan, Gulian C., 232 E. 116th St., New York City, N. Y.
 1888 Fair, J. D., Berlin, Ohio.
 1886 Faust, J., 209 Union St., Poughkeepsie, N. Y.
 1888 Faville, G. C., 210 St. Paul St., Baltimore, Maryland.
 1863 Flagg, O. H., New Bedford, Massachusetts.
 1892 Forbes, John, South Omaha, Nebraska.
 1892 Formad, Robert, 1008 N. 6th St., Philadelphia, Pa.
 1883 Frinck, J. H., St. John, New Brunswick.

 1892 Gadsden, John W., 128 N. 10th St., Philadelphia, Pa.
 1892 Giffen, Thomas, 125 W. 56th St., New York City, N. Y.

ELECTED

- 1884 Gilbert, E. G., Pottstown, Pa.
 1888 Gill, H. D., 896 Bedford Ave., Brooklyn, N. Y.
 1888 Glass, Alexander, 2125 Sansom St., Philadelphia, Pa.
 1888 Goentner, Charles T., Bryn Mawr, Montgomery County, Pa.
 1890 Grange, E. A. A., Agricultural College, Michigan.
 1890 Griffin, G. E., 5th Cavalry, Fort Reno, Oklahoma Territory.
 1892 Gunning, Thomas J., Neponset, Bureau County, Illinois.
- 1877 Hall, C. H., Hotel Holt, 14 Carver St., Boston, Mass.
 1892 Hall, John, Falls City, Nebraska.
 1892 Hanson, H. D., 160 Eldridge St., New York City, N. Y.
 1888 Harger, S. J. J., N. E. cor. 20th and Race Sts., Philadelphia, Pa.
 1881 Harrison, Ralph, cor. Scotia and Bothnia Sts., Boston, Massachusetts.
 1889 Hartman, G. R., 2130 N. 4th St., Philadelphia, Pa.
 1888 Hassall, Albert, 1115 Carrollton Ave., Baltimore, Maryland.
 1890 Hawkins, J., 303 3d St., Detroit, Michigan.
 1885 Hawk, J. W., 10 Market St., Newark, N. J.
 1890 Hickman, R. W., 509 W. 59th St., New York City, N. Y.
 1889 Hill, A. G., 110 Putnam St., East Boston, Massachusetts.
 1892 Hinebauch, J. D., Fargo, North Dakota.
 1889 Hinkley, Nelson P., 395 Ellicot St., Buffalo, N. Y.
 1888 Hitchcock, W. A., Malden, Massachusetts.
 1888 Hoffmann, D. R., 109 S. Arlington Ave., Baltimore, Maryland.
 1892 Holden, H. E., Springfield, Massachusetts.
 1885 Hollingsworth, W. G., 45 Catharine St. Utica, N. Y.
 1890 Hollingsworth, C. E., La Salle, Illinois.
 1892 Honan, J. H., Delphi, Indiana.
 1878 Hopkins, J. D., 32 Franklin St., Newark, N. J.
 1892 Hopper, John B., Ridgewood, N. J.
 1888 Hoskins, W. Horace, 12 S. 37th St., Philadelphia, Pa.
 1882 Howard, L. H., 1440 Washington St., Boston, Massachusetts.
 1884 Howe, William R., Dayton, Ohio.
 1892 Huelsen, J., Abattoir, Jersey City, N. J.
 1890 Hughes, Joseph, 2537 State St., Chicago, Illinois.
 1890 Huhne, J. A., Rondout, N. Y.
 1884 Huidekoper, R. S., 129 W. 52d St., New York City, N. Y.
 1890 Hunter, S. L., Fort Leavenworth, Kansas.
 1888 Huntington, F. W., Woodford, Maine.
- 1888 Jackson, J. C., 46 Woodworth Ave., Yonkers, N. Y.
 1886 Jacobus, J. H., 547 W. 35th St., New York City, N. Y.
 1892 Jakeman, William, Halifax, Nova Scotia.
 1885 James, H. F., 2627 Olive St., St. Louis, Missouri.
 1884 James, V. L., Cooperstown, N. Y.
 1892 Jarman, G. Allan, Chestertown, Maryland.
 1890 Johnson, George A., Room 47 Evans' Block, Sioux City, Iowa.
 1888 Johnson, S. K., 117 W. 25th St., New York City, N. Y.
 1892 Johnston, Wyatt, 99 Union Ave., Montreal, Canada.

ELECTED

- 1892 Jones, Neil B., Chillicothe, Ohio.
1892 Jopling, William, Owosso, Michigan.
- 1883 Kay, R., 365 W. 36th St., New York City, N. Y.
1890 Kennedy, J. T., West Union, Iowa.
1891 Kenney, John A., 408 E. 13th St., New York City, N. Y.
1892 Kiernan, P. F., Jefferson Barracks, Missouri.
1890 Kilborne, F. L., Department of Agriculture, Washington, D. C.
1891 Knowles, M. E., Riverside, Montana.
1886 Kooker, W. S., 457 N. 4th St., Philadelphia, Pa.
- 1891 Labaw, W. L., 50 Village St., Boston, Massachusetts.
1890 Lanigon, O. J., Wenona, Illinois.
1886 Leatherman, A. S., Clinton, N. J.
1887 Lee, D. D., 547 Albany St., Boston, Massachusetts.
1882 Leighton, J. A., 505 W. 42d St., New York City, N. Y.
1889 Lemay, D., Fort Riley, Kansas.
1892 Leonard, H. F., 781 Tremont St., Boston, Massachusetts.
1890 Letta, Richard R., 34 Newark St., Hoboken, N. J.
1863 Liautard, Alexander, 141 W. 54th St., New York City, N. Y.
1886 Lowe, W. H., 190 Ellison St., Paterson, N. J.
1892 Lowe, J. P., 190 Ellison St., Paterson, N. J.
1889 Lussion, L. O., Ardmore, Pa.
1884 Lyford, C. C., 821 Third Ave., South Minneapolis, Minnesota.
1875 Lyman, C. P., 50 Village St., Boston, Massachusetts.
- 1890 McCapes, D. B., Vermilion, South Dakota.
1892 McDonough, James, 617 Bloomfield Ave., Montclair, N. J.
1876 McInnes, B., Charleston, S. C.
1888 McKee, James, 10 Thompson St., Stapleton, Staten Island, N. Y.
1891 McKinney, W. H., Geneseo, Illinois.
1885 McLaughlin, J. A., 159 Benefit St., Providence, R. I.
1887 McLean, C. C., 1001 Water St., Meadville, Pa.
1876 McLean, L., 14 and 16 Nevins St., Brooklyn, N. Y.
1879 McLean, R. A., 14 and 16 Nevins St., Brooklyn St.
1883 McLellan, E. A., 144 Noble St., Bridgeport Connecticut.
1882 McLellan, F. W., 144 Noble St., Bridgeport, Connecticut.
1890 McMurdo, C. D., Fort Sill, Oklahoma Territory.
1891 McNeil, James C., 26 4th St., Pittsburg, Pa.
1892 Machan, Alexander, 69 River St., Paterson, N. J.
1889 Mackey, C. A., 202 E. 81st St., New York City, N. Y.
1887 Martinet, W. H., 2140 E. Hoffman, St., Baltimore, Maryland.
1891 Mayo, N. S., Manhattan, Kansas.
1891 Meisner, H. A., 1133 Aisquith St., Baltimore, Maryland.
1888 Melvin, A. D., 4122 Halsted St., Chicago, Illinois.
1888 Mercer, E. R., Montclair, N. J.
1877 Meyer, Sr. J. C., 326 Plum St., Cincinnati, Ohio.
1875 Meyer, Jr., J. C., 379-81 Walnut St., Cincinnati, Ohio.

ELECTED

- 1890 Meyer, John S., 513 Edmond St., St. Joseph, Missouri.
 1874 Michener, Charles B., Dept. of Agriculture, Washington, D. C.
 1892 Michener, Mayhew, E. Colmar, Montgomery County, Pa.
 1888 Middleton, William D., Fishkill-on-the-Hudson, N. Y.
 1879 Miller, William B. E., 527 Penn St., Camden, N. J.
 1892 Mills, C. C., Mt. Palatine, Putnam County, Illinois.
 1890 Morrison, R. R., White Plains, New York.
 1887 Moyer, O. R., Mt. Carroll, Illinois.
 1890 Myers, John A., Harrisonburg, Rockingham County, Va.

- 1890 Neher, Herbert, 350 W. 48th St., New York City, N. Y.
 1890 Nelson, S. B., Spokane Falls, Washington.
 1891 Nesbitt, Edward J., 16 Grand St., Poughkeepsie, N. Y.
 1888 Newman, Philip, 292 Hayward St., Brooklyn, N. Y.
 1892 Nief, F. A., 1342 Bush St., San Francisco, California.
 1891 Niles, E. P., Blacksburg, Virginia.
 1891 Niles, W. B., Ames, Iowa.
 1892 Nunan, William L., Lansdowne, Pa.

- 1890 O'Brien, F. W., Hannibal, Missouri.
 1890 Ogle, Jr., Joseph, Greenport, N. Y.
 1886 Ogle, Ralph, 312 W. 59th St., New York City, N. Y.
 1889 Osborne, E. M., East Hampton, Long Island, N. Y.
 1881 Osgood, F. H., 50 Village St., Boston, Massachusetts.

- 1888 Paaren, N. H., 4122 Halsted St., Chicago, Illinois.
 1891 Paige, James B., Amherst, Massachusetts.
 1886 Paquin, Paul, Battle Creek, Michigan.
 1889 Parsons, E. A., 134 W. 39th St., New York City, N. Y.
 1892 Pearson, Leonard, 2200 Pine St., Philadelphia, Pa.
 1883 Pendry, W. H., 351 St. Mark's Place, Brooklyn, N. Y.
 1877 Penniman, G. P., Exchange St., Worcester, Massachusetts.
 1863 Penniman, J., Exchange St., Worcester, Massachusetts.
 1889 Perry, Charles H., 47 Montgomery St., Jersey City, N. J.
 1883 Peters, Austin, 35 Congress St., Boston, Massachusetts.
 1891 Peterson, W. E., 509 Main St., Waltham, Massachusetts.
 1890 Phillips, J. M., 3146-48 Easton Ave., St. Louis, Missouri.
 1890 Phillips, S. E., Wichita, Kansas.
 1890 Piatt, H. B., 3710 N. 9th St., St. Louis, Missouri.
 1890 Piche, M. A., Fort Grant, Arizona.
 1883 Pierce, Benjamin D., Springfield, Massachusetts.
 1890 Pope, G. W., 2537 State St., Chicago, Illinois.
 1892 Pote, T. B., Mt. Vernon, Indiana.
 1885 Prophett, W. H., 59 Fairfield Ave., Bridgeport, Connecticut.
 1890 Purcell, C. W., Biddeford, Maine.

- 1890 Ramsey, A. E., Louisiana, Missouri.
 1885 Rayner, James B., 135 E. Gay St., West Chester, Pa.

ELECTED

- 1885 Rayner, T. B., Chestnut Hill, Philadelphia, Pa.
1891 Reynolds, M. H., Keosauqua, Iowa.
1890 Richards, W. H., Emporia, Kansas.
1888 Robertson, A. K., Green Ave. and Broadway, Brooklyn, N. Y.
1868 Robertson, J. L., 409 9th Ave., New York City, N. Y.
1889 Robinson, W. H., 26 Pleasant St., Charleston, Massachusetts.
1892 Rogers, Howard P., Allston, Boston, Massachusetts.
1878 Rose, A. H., Littleton, Massachusetts.
1887 Rose, William, Stapleton, Staten Island, N. Y.
1880 Rose, William H., 18 Broadway, New York City, N. Y.
1884 Ross, E. C., 278 Elm St., New Haven, Connecticut.
1890 Rouif, A., 317 W. Channing St., St. Louis, Missouri.
1885 Rowland, H. W., 34 Nelson Place, Newark, N. J.
1889 Russell, F. L., Orono, Maine.
1889 Russell, W. T., Nashua, N. H.
1881 Ryan, J. F., 401 Illinois St., Chicago, Illinois.
- 1887 Salmon, D. E., Bureau of Animal Industry, Washington, D. C.
1882 Saunders, Fred., Lynn, Massachusetts.
1871 Saunders, R. J., Salem, Massachusetts.
1876 Saunders, J. S., American Stables, Sudbury St., Boston, Mass.
1890 Sayre, C. E., 3725 Cottage Grove Ave., Chicago, Ill.
1885 Schiebler, J. W., 312 3d St., Memphis, Tennessee.
1888 Schroeder, E. C. H., Washington, D. C.
1890 Schwartzkopff, Olof, 637 Cedar St., St. Paul, Minnesota.
1892 Seale, J. H., Spokane Falls, Washington.
1887 Sellers, A. T., 312 S. 5th St., Camden, N. J.
1890 Shaw, Walter, Dayton, Ohio.
1892 Sheldon, A. J., 141 W. 54th St., New York City, N. Y.
1882 Sherman, W. A., 98 Pawtucket St., Lowell, Massachusetts.
1892 Smith, D. E., Great Neck, Queens County, Long Island, N. Y.
1890 Sollberger, R. J., 1334 S. 7th St., St. Louis, Missouri.
1890 Spangler, J. S., Aurora, Illinois.
1892 Stalker, M., Ames, Iowa.
1889 Stanwood, R. E., Freehold, N. J.
1892 Steddom, R. P., Galesburg, Illinois.
1890 Stewart, S., care Swift & Co., Kansas City, Missouri.
1863 Stickney, J. H., American Stables, Sudbury St., Boston, Mass.
1892 Stinson, William, 59 Blossom St., Chelsea, Massachusetts.
1887 Strange, A., 322 W. 15th St., New York City, N. Y.
- 1890 Thompson, A. J., Terre Haute, Indiana.
1882 Travers, Frank, Rhinebeck, N. Y.
1885 Trumbower, M. R., 502 3d Ave., Sterling, Illinois.
1891 Turner, J. P., Fort Niobrara, Nebraska.
1887 Turner, Thomas J., Columbia, Missouri.
1888 Tuttle, A. A., New Britain, Connecticut.

ELECTED

- 1889 Vander Roest, H., 315 Mulberry St., Newark, N. J.
1887 Van Mater, George G., 354 Macon St., Brooklyn, N. Y.
1890 Valerius, N. P., Watertown, Wisconsin.
1872 Very, T. S., 82 Pitt St., Boston, Massachusetts.
1884 Vogt, A. G., 103-105 Plane St., Newark, N. J.
1892 Voorhees, E. R., Somerville, N. J.
- 1890 Walker, R. G., 20 S. Carpenter St., Chicago, Illinois.
1890 Waller, H. N., Windom, Minnesota.
1888 Walmer, E. S., 3227 M St., Georgetown, D. C.
1887 Walrath, James A., 444 Jersey Ave., Jersey City, N. J.
1886 Warner, G. L., 117 W. 25th St., New York City, N. Y.
1886 Waters, E., 112 Ashland Place, Brooklyn, N. Y.
1890 Waugh, James A., 49 Race St., Allegheny City, Pa.
1886 Weber, S. E., Lancaster, Pa.
1890 Webster, R. G., Media, Pa.
1888 Wende, John, 1593 Main St., Buffalo, N. Y.
1892 Wende, Benjamin P., Milgrove, Erie County, Pa.
1892 Wertz, William B., 4531 Lancaster Ave, Philadelphia, Pa.
1890 White, T. E., Sedalia, Missouri.
1892 Whitmore, N. P., Gardner, Illinois.
1888 Whitney, Harrison, 20 George St., New Haven, Connecticut.
1892 Wilkinson, F. C., Claremont, N. H.
1884 Williams, W. L., Lafayette, Indiana.
1878 Winchester, J. F., Lawrence, Massachusetts.
1890 Withers, R. J., 2537 State St., Chicago, Illinois.
1878 Wray, W. H., No. 7 Church Road, Upper Norwood, London, Eng.
1890 Wright, J. M., 2537 State St., Chicago, Illinois.
- 1880 Zuill, W. L., 1526 Race St., Philadelphia, Pa.

HONORARY MEMBERS.

- 1890 Biggs, Prof. H. M. Bellevue Medical College, New York City. Proposed by H. D. Gill.
- 1877 Boulay, Henri. General Inspector of Veterinary Schools of France. Paris, France. Proposed by A. Liautard. Deceased.
- 1866 Busteed, John. New York. Proposed by J. H. Stickney and E. F. Thayer.
- 1869 Burnham, Walter L. Lowell, Mass. Proposed by R. Wood.
- 1892 Chauveau, Prof. A. Director-General of the Veterinary Schools of France. Anatomist, Physiologist, Work on Contagious Diseases, etc. Lyons, France. Proposed by R. S. Huidekoper and A. Liautard.
- 1868 Curtis, R. H. New York. Proposed by A. Liautard and E. F. Thayer. 1869. Died.
- 1877 Fleming, George, F.R.S.S., V.S. Royal Engineers. Editor of Manual of Comparative Pathology. Proposed by A. Liautard.
- 1892 Michener, Isaiah. Born January 12, 1812. In active practice sixty years in Eastern Pennsylvania and the border counties of New Jersey. Was one of the earliest names mentioned in connection with the original College in Philadelphia. Attended "Dadd's Clinics" in Boston. Honorary Member of the Pennsylvania State Veterinary Medical Association. One of the first members of the profession to recognize and treat the disease which is commonly termed "Cerebro-spinal Meningitis;" also to bring it into public notice through his accounts in public periodicals. Carversville, Pa. Proposed by Thomas B. Rayner and W. Horace Hoskins.
- 1871 Percy, S. R., M.D. Member of the Faculty of the N. Y. C. V. S. Proposed by A. Liautard. 1890. Died.
- 1890 Raymond, J. H., M.D. 173 Joralemon St., Brooklyn, N. Y. First Commissioner of Health to recognize the need of a veterinarian on the staff. Proposed by L. McLean.
- 1871 Stein, A., M.D. Member of the Faculty of the N. Y. C. V. S. Proposed by A. Liautard. 28 W. 15th St., New York City.
- 1872 Thayer, J. L., M.D. Graduate of Harvard Medical College. West Newton, Mass. Proposed by Dr. Saunders.
- 1871 Weisse, F. D., M.D. Member of the Faculty of the N. Y. C. V. S. 46 W. 20th St., New York City. Proposed by A. Liautard.
- 1892 Welch, William H., M.D. Professor of Pathology Johns Hopkins University. Proposed by A. W. Clement and R. S. Huidekoper. Indorsed by Maryland State Veterinary Medical Association.

MEMBERS-ELECT WHO HAVE NOT QUALIFIED.

Ashe, Fred. W., 187 26th St., Chicago, Illinois.

Bachman, E. D., Chester, Orange County, N. Y.

Barnett, Otis, Edwardsville, Illinois.

Batten, Eugene C., 18 Burnett St., East Orange, N. J.

Bear, Benjamin S. J., York, York County, Pa.

Bigelow, Alfred M., Norwood, Massachusetts.

Breslin, D. S., 94 Adams St., Brooklyn, N. Y.

Brown, John E., Oskaloosa, Iowa.

Burr, Alexander, Brighton, Massachusetts.

Carrick, Charles, McKeesport, Pa.

Cherry, J. M., St. Joseph, Missouri.

Cloud, J. E., Richmond, Wayne County, Indiana.

Curry, W. W., Hackensack, N. J.

Darling, A., 3230 Locust St., St. Louis, Missouri.

Davitt, M. H., 811 19th St., N. W., Washington, D. C.

De Ronde, J. D., Nyack, N. Y.

Dews, Henry H., New Bedford, Massachusetts.

Dodge, William H., Leominster, Massachusetts.

Dunn, R. A., Titusville, Pa.

Edwards, Warren Thomas, Downingtown, Chester County, Pa.

Eliot, H. W., 800 Broad St., Newark, N. J.

Ellis, Robert W., 468 W. 150th St., New York City, N. Y.

Farrington, A. M., Department of Agriculture, Washington, D. C.

Foss, George B., 50 Village St., Boston, Massachusetts.

Gage, F. H., 509 W. 59th St., New York City, N. Y.

Harrison, W. F., Bloomfield, Essex County, N. J.

Hill, Joseph G., Sennett, New York.

Hoover, Lee, Richmond, Wayne County, Indiana.

Ingalls, E. B., Mohawk, N. Y.

Krowl, I. N., Passaic, N. J.

30 MEMBERS-ELECT WHO HAVE NOT QUALIFIED.

Lambert, H. D., Salem, Massachusetts.

Leis, Robert L., 38 Frederick St., Newark, N. J.

Lintz, Charles, 316 E. Broad St., Chester, Pa.

Loblein, E. L., New Brunswick, N. J.

Lord, William S., United States Hotel, Portland, Maine.

McIntosh, A. H., 113 Washington St., Morristown, N. J.

McKenna, Edward P., 101 Main St., Woburn, Massachusetts.

McLeod, Edward J., 1149 Niagara St., Buffalo, N. Y.

Mahoney, Francis X., 50 Village St., Boston, Massachusetts.

Millar, John J., Sioux City, Iowa.

Miller, John E., Christianburg, Montgomery County, Virginia.

Morris, Claude, Green Ave. and Broadway, Brooklyn, N. Y.

Ogden, E. R., Orange, N. J.

Parker, John M., Haverhill, Massachusetts.

Roberts, E. D., Janesville, Wisconsin.

Schoenleber, F. S., Morris, Illinois.

Sherwood, Thomas G., 854 Seventh Ave. New York City, N. Y.

Smith, Theobald, 1527 O St., N. W., Washington, D. C.

Stockwell, G. Archie, 650 Congress St., East Detroit, Michigan.

Story, R. W., Princeton, Illinois.

Stringer, N. I., Fairbury, Illinois.

Stull, C. M., South Bend, Indiana.

Swedberg, Alf. W., 1402 G St., N. W., Washington, D. C.

Turcot, Isidore, Minto, Walsh County, North Dakota.

Whitney, J. C., Hillsdale, Michigan.

Wittpenn, J. N., 217 Whiton St., Jersey City, N. J.

MEMBERS DROPPED.

- 1890 Agersborg, G. S., Vermilion, Dakota.
1889 Anderson, James, New York City, N. Y.
1891 Appell, W. W., Pleasant Valley, Pennsylvania.
- 1892 Barnes, A. S., Maquoketa, Iowa.
1891 Beckley, E. M., Meriden, Connecticut.
1883 Bell, L. C., New York.
1892 Boyd, H. B., New Rochelle, N. Y.
1883 Brackin, J. A., Pittsfield, Massachusetts.
1883 Budd, I. F., New Jersey.
1890 Bushman, Joseph C., Washington, D. C.
- 1890 Campbell, L. C., Philadelphia, Pa.
1891 Churchill, R. T., North Bergen, N. J.
1890 Colburn, C., W. Dedham, Massachusetts.
1890 Colsson, P. Z., Mobile, Alabama.
1890 Cosgrove, J. B., Worcester, Massachusetts.
1890 Crane, L. M., New York City, N. Y.
1892 Cuff, W. E., New York City, N. Y.
1891 Culbert, J. S., Portland, Indiana.
- 1892 Daniels, W. D., Cardington, Ohio.
1890 Detmers, H. J., Champaign, Illinois.
1890 Dimond, William, Salt Lake City, Utah.
1892 Dyer, Charles K., Baltimore, Maryland.
- 1883 Farley, O. C., Boston, Massachusetts.
1890 Farnsworth, G. H., Rutland, Vermont.
1876 Fernsler, Philip, Pennsylvania.
1890 Field, S. S., New York City, N. Y.
1875 Finley, R. W., New York City, N. Y.
1890 Foote, H. T., New York City, N. Y.
1890 Foy, J. J., New York City, N. Y.
- 1891 Gardner, J. E., Hartford, Connecticut.
1890 Gerth, Jr., J. C., Newark, N. J.
1891 Grimshaw, G., Ontario, Canada.

- 1884 Hall, Ralph, New York City, N. Y.
1890 Hanshew, E., Brooklyn, N. Y.
1890 Hanshew, J. F., Brooklyn, N. Y.
1890 Harris, William N., New York City, N. Y.
1891 Herbert, F. C., Marlboro, N. J.
1892 Hinman, W. J., Winnipeg, Manitoba.
1891 Hitchings, W. H., Somerville, Massachusetts.
1886 Holcombe, A. A., Plainfield, N. J.
1890 Humphrey, W. P., Elizabeth, N. J.
- 1892 Jackson, C. C., Marshall, Missouri.
1891 Jasme, A., Savannah, Georgia.
1892 Johnstone, J., St. Joseph, Missouri.
- 1890 Kelly, W. H., Albany, N. Y.
1890 Kemp, J. L., Brooklyn, N. Y.
1891 Klicker, H. C., Clarence, N. Y.
1892 Klutta, L. M., Clinton, Missouri.
- 1890 Laidlaw, R., Albany, N. Y.
1891 Lamberton, Fred., New London, Connecticut.
1880 Law, James, Ithaca, N. Y.
1885 Lawrence, Henry.
- 1883 McLaughlin, J. M., Lynn, Massachusetts.
1890 McNicol, J. E., New York City, N. Y.
1891 Maloney, Thomas E., Central Falls, R. I.
1890 Marshall, Alexander, Massachusetts.
1889 Martin, Charles, Evansville, Indiana.
1890 Mathues, Samuel, Elam, Delaware County, Pa.
1890 Miles, William, Charlestown, Illinois.
1890 Mitchell, William R., New York City, N. Y.
1891 Morice, Jr., J., New Orleans, Louisiana.
1889 Moyer, T. W., Easton, Pa.
- 1879 Nostrand, E., New York City, N. Y.
- 1891 O'Connell, Maurice, Holyoke, Massachusetts.
1883 O'Sullivan, William J., New Haven, Connecticut.
1890 Otto, William J., New York City, N. Y.
1891 Orlopp, B. G., Indianapolis, Indiana.
- 1891 Page, I. F., Manchester, Vermont.
1891 Peabody, C. H., Providence, Rhode Island.
1891 Pearson, G. G., Philadelphia, Pa.
1883 Plageman, L. V., Brooklyn, N. Y.
1892 Plummer, Alexander, Mammoth Hot Springs, Wyoming.
1892 Price, R., St. Paul, Minnesota.

- 1892 Quitman, P., Chicago, Illinois.
- 1890 Rice, F. E., Hartford, Connecticut.
1891 Richards, S. L., Salt Lake City, Utah.
1891 Roberts, George H., East Shelby, N. Y.
1891 Roche, E. W., Boston, Massachusetts.
1883 Rogers, Thomas B., Newark, N. J.
1891 Rowland, E. W., Monroe, Wisconsin.
1891 Rowland, Ward B., Pasadena, California.
1892 Rutherford, John D., Rock Island, Illinois.
1890 Ryder, J. E., Long Island, N. Y.
1890 Ryder, J. F., Rondout, N. Y.
- 1891 Sallade, J. W., Pottsville, Pa.
1890 Schauffler, Charles, Philadelphia, Pa.
1888 Schmidt, W. G., Newark, N. J.
1892 Schrieber, A. F., Philadelphia, Pa.
1890 Simmons, William T., Boston, Massachusetts.
1890 Skally, J. M., Boston, Massachusetts.
- 1892 Thomas, L. A., Atlantic, Iowa.
1892 Tillie, John, Muscatine, Iowa.
1891 Tucker, Richard L., Mount Holly, N. J.
- 1891 Walsh, William J., New York City, N. Y.
1890 Walton, F. M., New York City, N. Y.
1891 Weidner, Charles J., Hellertown, Pa.
1892 Werner, G. W., Appleton City, Missouri.
1892 Williams, G. C., Dewitt, Iowa.
1890 Williams, Charles, Philadelphia, Pa.
1891 Wilson, J. P., Hamilton, Ohio.
1891 Winant, Frank, Greenfield, N. Y.
1890 Winslow, K., Boston, Massachusetts.
1890 Winslow, Charles, Rockland, Massachusetts.
- 1891 Yokura, H. T., Tokio, Japan.
1891 Young, A. C., Salt Lake City, Utah.

DECEASED MEMBERS.

- 1892 Atkinson, V. T., 563 Milwaukee St., Milwaukee, Wisconsin.
- 1863 Bowler, G. W., Ohio.
- 1891 Bridges, George, Norwalk, Connecticut.
- 1887 Brown, A. L., 35 Summer St., Stamford, Connecticut.
- 1863 Busteed, John, New York.
- 1863 Copeman, A. S., Utica, N. Y.
- 1869 Curtis, R. H., Brooklyn, New York.
- 1890 Fogg, J. C., 82 Chardon St., Boston, Massachusetts.
- 1892 Kidd, J. L., 102 E. Main St., Lexington, Kentucky.
- 1890 Lathrop, G. A., 77 Collier St., Binghamton, N. Y.
- 1890 Lockhart, A., 124 E. 13th St., New York City, N. Y.
- 1889 Moulton, Charles, 1075 E. Capitol St., Washington, D. C.
- 1893 Mustoe, J. F., 217 7th St., Brooklyn, E. D., N. Y.
- 1864 Palmer, Edwin H., Pennsylvania.
- 1890 Percy, S. R., 56 W. 25th St., New York City, N. Y.
- 1884 Saunders, William, New York.
- 1889 Thayer, E. F., West Newton, Massachusetts.
- 1891 Tye, F. M., Muncie, Indiana.
- 1873 Wisdom, William A., Wilmington, Delaware.
- 1891 Wood, Robert, Lowell, Massachusetts.
- 1869 Wood, Charles M., Boston, Massachusetts.

MEMBERS RESIGNED.

- 1892 Claris, John T., 627 Clinton St., Buffalo, N. Y.
1867 Curtis, R. M., Brooklyn, N. Y. Resignation was accepted in 1868,
and was elected an Honorary Member.
1890 Hummel, A. L., Philadelphia, Pa.
1878 McLean, L., 16 Nevins St., Brooklyn, N. Y.; re-elected in 1879.
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MEMBERS EXPELLED.

- 1880 Billings, F. S., Chicago, Illinois. Expelled 1890.
1863 Jennings, R., Bordentown, N. J. Expelled 1866.
1887 Jones, R. C., Port Jefferson, Long Island, N. Y. Expelled 1889.
1863 McClure, Robert, Philadelphia, Pa. Expelled 1865.
1889 Prothero, W. B., Horton P. O., Pa. Expelled 1890.
1884 Schaffer, D. M., New Castle, Indiana. Expelled 1888.
1885 Spranklin, T. W., Baltimore, Maryland. Expelled 1889.

CONSTITUTION AND BY-LAWS, 1893.

ADOPTED SEPTEMBER 17, 1889.

CONSTITUTION.

ARTICLE I. This Association shall be known as the "UNITED STATES VETERINARY MEDICAL ASSOCIATION." It shall consist of stated and honorary members.

ART. II. The purposes and object of the Association are, to contribute to the diffusion of true science, and particularly the knowledge of veterinary medicine and surgery.

ART. III. The officers of this Association shall be a President, Vice-President, Recording Secretary, and Treasurer, all of whom shall be elected by ballot, at each anniversary meeting, and a majority of all the votes present shall be necessary to a choice. They shall be elected for one year, or until their successors are chosen, to whom they shall, without delay, deliver and transfer all moneys, books, manuscripts, vouchers, and all other property or papers belonging to the Association in their possession.

ART. IV. A Board of Censors, consisting of seven members, shall be appointed by the President to serve for one year. The several officers of the Association with Board of Censors shall constitute the *Comitia Minora*.

ART. V. The duties of the officers, requisites of membership, time of the annual or other meetings of the said Association, and such other regulations as may be necessary and proper for the government of the same, shall be provided for by by-laws.

BY-LAWS.

CHAPTER I. PRESIDENT.

ARTICLE I. It shall be the duty of the President to preside at all meetings of the Association, and preserve order and decorum.

ART. II. He shall appoint all committees, unless otherwise ordered by special resolution.

ART. III. He shall annually appoint resident State Secretaries, who shall perform such duties as may be assigned them.

ART. IV. He shall have no vote, except on questions where the votes are equally divided, and in the election of officers.

ART. V. He shall keep on file all documents and certificates in relation to the Association that may be deposited with him, and these he shall deliver to his successor.

ART. VI. The President shall perform all the duties prescribed by the laws of the Association and resolutions thereof.

CHAPTER II. SECRETARY.

ARTICLE I. The Secretary shall keep the records of the proceedings of the meetings of the Association. He shall receive all applications and fees for membership, and pay the same over to the Treasurer, at least once in six months, taking his receipt therefor.

ART. II. It shall be the duty of the Secretary to notify each person proposed, and transmit him a copy of the By-laws, calling his attention to the 1st, 2d, 3d, and 4th Sections of Chapter VIII. of the By-laws.

ART. III. He shall also notify the chairman of any and all committees appointed by the President or the Association, stating the duties and names of the committee, and he shall also perform such other duties as may be assigned to him.

ART. IV. The Recording Secretary shall be exempt from all dues.

ART. V. He shall receive an annual salary of two hundred dollars.

ART. VI. He shall publish annually a list of the officers, standing committees, and members, with their addresses.

CHAPTER III. TREASURER.

ARTICLE I. The Treasurer shall give security for the trust reposed in him, whenever the Association shall judge it requisite.

ART. II. It shall be the duty of the Treasurer to put all the moneys of the Association into one fund: to be appropriated to the payment of current expenses and for such other purposes as the Association may, at its meetings, direct.

ART. III. He shall pay by order of the President all bills duly audited by the Finance Committee.

ART. IV. At every annual meeting he shall give a detailed statement of his receipts and disbursements, duly audited and signed by the Finance Committee.

CHAPTER IV. COMITIA MINORA.

ARTICLE I. The President, Vice-President, or President *pro tempore*, together with four Censors, shall constitute a quorum for the examination of candidates for membership; but any five members may constitute a quorum for the transaction of business.

ART. II. The Comitia Minora shall meet at least once in six months.

ART. III. The President may call a special meeting of the Comitia Minora whenever he shall deem it necessary.

ART. IV. The Journal of the proceedings of the Comitia Minora shall be kept by the Secretary and read at each annual meeting, together with the names of the attending and absent members.

ART. V. It is incumbent upon the Board of Censors to be present at every meeting; but when unavoidably absent the vacancy shall be temporarily filled by the President, Vice-President, or President *pro tempore*.

ART. VI. It shall be the duty of the Comitia Minora to examine the credentials and vouchers of all applicants for membership. They shall report in writing the result of their examination to the President of the Association.

ART. VII. The Comitia Minora shall be invested with power to hear or determine upon complaints filed before them in writing, relative to the improper or immoral conduct of any member, and shall, if thought advisable, report upon such complaint to the Association at the next annual meeting, the offending member being duly notified of such complaint, and allowed the privilege of defence; and such member, if deemed guilty by a vote of two-thirds of the members present, shall cease to be a member of the Association.

ART. VIII. The Comitia Minora shall make the necessary arrangements for the meetings of the Association, and execute such other duties as the Association shall direct.

CHAPTER V. COMMITTEES.

ARTICLE I. The following committees shall be appointed by the President at the annual meeting, namely:

The Committee on Intelligence and Education.

Committee on Diseases.

Finance Committee.

Prize Committee. And a

Publication Committee.

ART. II. The Committee on Intelligence and Education shall collect and report to this Association recent veterinary medical facts and intelligence.

ART. III. It shall be the duty of the Committee on Diseases to inves-

tigate the character and extent of prevalent diseases throughout the United States, and report at each meeting.

ART. IV. The Finance Committee shall audit the Treasurer's account and also all other accounts that may be presented to the Association for payment; and they shall also devise ways and means to raise funds when necessary, to meet the expenditures of the Association, and report their proceedings at each annual meeting.

ART. V. It shall be the duty of the Prize Committee to examine all essays presented to them and award prizes if the papers are in their judgment worthy the same, and their decision shall be final.

ART. VI. The Publication Committee shall have charge of the publishing of all essays, papers, reports, etc., submitted to them by the Association.

ART. VII. The President and Secretary shall be *ex-officio* members of the several permanent committees, and the President shall have the power to convene them whenever, in his judgment, it shall be necessary.

CHAPTER VI. CANDIDATES FOR MEMBERSHIP.

ARTICLE I. Any applicant for membership shall submit his name upon one of the Association's application blanks, duly vouched for by one or more members of the Association, or by the resident State Secretary of his respective State. He shall be a graduate of a regularly organized and recognized Veterinary school, which shall have a curriculum of at least three years, of six months each, specially devoted to the study of Veterinary science, and whose corps of instructors shall contain at least four Veterinarians. If of a medical school a similar curriculum shall prevail. Second, that he is of moral character and reputable business methods.

This to go into effect January 1, 1893. It shall not be retroactive nor apply to applicants who were college matriculants prior to its passage, or during the year 1892.

Form of Application blank.

(This application should be filed with the Secretary at least thirty days before the third Tuesday in September; filled in the applicant's own handwriting, and so endorsed by his vouchers.)

To the United States Veterinary Medical Association:

, 189 . I hereby make application for
membership in your Society. My age is . years. I am a
graduate of . College, year . My
residence is (Signed) .

Vouchers:

Degree.

Degree.

*Degree, Member or resident State Secretary of
the United States Veterinary Medical Association.*

ART. II. The credentials of all applicants shall be referred to the Comitia Minora, who shall report upon the same, in writing, to the President.

ART. III. All candidates reported favorably by the Comitia Minora shall be balloted for by the Association. Those receiving a two-thirds vote of the members present shall become members of the Association.

ART. IV. All applications of candidates for membership adversely reported shall not again be entertained until the expiration of one year.

ART. V. A member elect shall, within one year, pay to the Secretary his initiation fee and annual dues, whereon he shall sign the Constitution and By-laws, and receive his certificate of membership.

ART. VI. The following shall be the

Form of Certificate of Membership.

These presents are to certify that _____, having been duly examined and found worthy, is this day admitted a member of the United States Veterinary Medical Association, incorporated in the year of our Lord, one thousand eight hundred and sixty-three.

In testimony whereof, we have fixed our hand and the _____ of the Association, this _____ day of _____, 18 .

Censors:

Secretary.
President.

CHAPTER VII. HONORARY MEMBERS.

ARTICLE I. Any member may propose a candidate as an honorary member; the rank or station held by him shall be furnished in writing by the proposer at the time of such proposal. The person so proposed shall be balloted for at a subsequent meeting. A majority of votes shall constitute him an honorary member.

ART. II. Not more than three honorary members shall be annually elected.

ART. III. Honorary members may take part in debate, but shall not be entitled to vote.

ART. IV. The President of the United States for the time being shall be *ex-officio* an honorary member. The following shall be the

Certificate for Honorary Members.

This is to certify that we, the President, Vice-President, and members of the United States Veterinary Medical Association, have received _____ as an Honorary Member of our Association.

In witness whereof, we have caused these presents to be signed by our President and Secretary, and sealed by our common seal, this _____ day of _____, 18 .

President.

Secretary.

CHAPTER VIII. CONTRIBUTIONS AND ARREARS.

ARTICLE I. The initiation fee shall be five dollars.

ART. II. The yearly dues of the Association are two dollars.

ART. III. The Association, at the annual meeting, may assess such amounts as shall be necessary to meet the necessary expenses.

ART. IV. Any member eighteen months in arrears shall be notified twice by the Secretary within six months; and if said arrears are not paid before the next regular meeting of the Association the Secretary shall report said delinquent to the Comitia Minora for suspension.

CHAPTER IX. ORDER OF BUSINESS.

1. The Secretary shall call the roll.
2. He shall read the minutes of the previous meeting.
3. Unfinished business of last meeting.
4. Report of the Comitia Minora and all committees.
5. Admission of new members.
6. Application for membership.
7. Election of officers.
8. New business.
9. Papers and discussion.

CHAPTER X. MEETINGS OF THE ASSOCIATION.

ARTICLE I. The annual meeting of the Association shall be held on the third Tuesday and following day of September of each year. The Comitia Minora shall select the place and hour of meeting, unless otherwise directed by the Association, due notice of which shall be given by the Secretary.

ART. II. Special meetings shall be called by the President, or in his absence by the Vice-President, upon the written request of ten members, specifying the particular object of such meeting, a notice of which shall be given at least one month before said meeting. The President is also authorized, at his discretion, to call special meetings, duly notified as above.

ART. III. At special meetings no other business except such as shall have been specified in the requisition and in the published call for the meeting shall be transacted.

ART. IV. The annual meetings may be adjourned from day to day.

ART. V. Twenty-five members shall form a quorum for the transaction of business, and a quorum shall always be presumed present, except at annual meetings, unless an actual count be called for.

ART. VI. In the absence of the President and Vice-President, the senior Censor present shall preside.

ART. VII. Every member shall observe order and decorum in the Association; shall pay due respect to the President and other officers, and to his fellow-members; and no member shall withdraw during the session without special permission from the Chair.

ART. VIII. All questions of order, whether in debate or otherwise, not specially provided for, shall be decided by the usual parliamentary rules.

CHAPTER XI. CODE OF ETHICS.

ARTICLE I. No member shall assume a title to which he has not a just claim.

ART. II. No member shall endeavor to build up a practice by undercharging his brother member.

ART. III. No member shall speak disrespectfully of another, or in any way attempt to lessen his professional reputation, particularly for his individual advancement.

ART. IV. In all cases of consultation it shall be the duty of the veterinary surgeon in attendance on the case to give the opinion of the consulting veterinary surgeon (whether favorable to his own or otherwise) to the owner of the patient in the presence of all three. In case of the absence of the owner the veterinary surgeon consulted may, after giving his opinion to the attending veterinary surgeon, transmit it also in writing to the owner through the medical attendant. It shall be deemed a breach of this Code for a consulting veterinary surgeon to revisit a patient without special invitation or agreement.

ART. V. In advertising, the veterinary surgeon shall confine himself to his business address. Advertising specific medicines, specific plans of treatment, advertising through the medium of posters, illuminated bills, newspaper puffs, etc., will not be countenanced by this Association.

ART. VI. *Secret medicines.* Any person who shall advertise or otherwise offer to the public any medicine the composition of which he refuses to disclose, or if he proposes to cure disease by any such secret medicines, shall be denounced as an unworthy member, and be expelled from the Association.

ART. VII. It shall be deemed a violation of the Code of Ethics for any member of this Association to contract with or through the officers of any Live Stock Insurance Company for the professional treatment of the members' stock so insured; but this rule shall not prevent any member from becoming the examiner of risks and to act in the capacity of an expert for the same.

ART. VIII. Every member shall observe the Code of Medical Ethics adopted by this Association, and be answerable to the Comitia Minora for any breach of the same.

CHAPTER XII. SUSPENSION AND ALTERATION OF BY-LAWS.

ARTICLE I. Any motion for suspension of By-laws must be offered in writing and must be adopted by a two-thirds vote of the members present.

ART. III. All proposals for alteration of By-laws shall be stated in writing. No alteration proposed by members shall be acted upon until it is referred to the Comitia Minora and presented anew by them. All the members of the Association shall be notified at least ten days previous to any action thereon.

ART. III. A suspension of the rules may be made by unanimous consent at any meeting of the Association for the election of honorary members.

UNITED STATES VETERINARY MEDICAL ASSOCIATION,

TWENTY-EIGHTH ANNUAL MEETING,

HELD AT WASHINGTON, D. C.,

SEPTEMBER 15 AND 16, 1891.

MINUTES OF THE PROCEEDINGS
OF THE
UNITED STATES VETERINARY MEDICAL ASSOCIATION
AT ITS TWENTY-EIGHTH ANNUAL MEETING,
HELD AT
WASHINGTON, D. C., SEPTEMBER, 1891.

FIRST DAY.—*Morning Session.*

THE meeting was called to order by the President, DR. HUIDEKOPER, September 15th at 10.30 A.M., in Willard's Hall. On roll-call by the Secretary, the following were present: Drs. Barron, Berns, Bryden, Clement, Dougherty, Faust, Faville, Hinkley, Hitchcock, Hoskins, Huidekoper, Huhne, Hilborne, Kidd, Lyford, Lowe, Martinet, Michener, Miller, R. A. McLean, Peters, T. B. Rayner, James L. Robertson, Swedberg, Thompson, Turner, Walmer, Wende, Weber, Winchester, W. L. Williams.

Others of the profession were present at the opening. Drs. John W. Gadsden, William B. Werntz, N. Rectenwald, Isaiah Michener, J. C. Walker, H. B. Rayner of Pennsylvania, Dr. J. C. Foelker, delegate from the Pennsylvania State Veterinary Medical Association; Dr. H. A. Meisner, of Maryland; and Dr. G. A. Jaman, District of Columbia; Drs. C. B. Robinson, J. D. Robinson, and J. E. Parsons of New Jersey; Drs. A. M. Farrington, William Runge, I. N. Krowl; Dr. J. C. Dustan, delegate from the Veterinary Medical Association of New Jersey; Dr. William Somerville, of New York; Dr. W. H. Scruby, of Minnesota; Dr. H. S. Hogsett, of Virginia, Dr. M. E. Knowles, of Indiana.

The President addressed the Association as follows:

GENTLEMEN: This Association has nearly completed the fourth decade of its existence, and within the last decade we have held meetings when we looked rather anxiously to know if there would be a working quorum of members present, and regretted, having come a

greater or less distance, that there was not more to be done than the alteration of some of the By-laws, the resurrection of some oftime discussed question on pleuro-pneumonia, and the eating of a dinner. Within the last few years no such problems have been obtrusive; we have gained in the number of our members and in the zeal with which they attend; since the adoption of the new Constitution—their last revision—the Constitution and By-laws have been let alone, and we trust that they will be unaltered for a long time to come; other diseases than lung-plague in cattle have demanded the attention and legislation of the country, and reports and papers have been of sufficient volume and merit to fully occupy our time.

Last year, for the second time, we varied the itinerary of the Association's cycles and left the New England and Middle States to go West, for which we were well rewarded; the older members were shown how large and how active the profession had grown in the vast agricultural districts of the Mississippi, and the veterinarians of that region learned that there existed a United States Veterinary Medical Association, founded, organized, and managed for the interest of the profession at large and destined to become in reality, as well as in name, the representative body of the whole country.

The success of the meeting held last year at Chicago seemed to demonstrate conclusively that the change from two semi-annual meetings of a day each, to one annual meeting, lasting over two or more days, had been a fortunate one; but the test and proof of this must lie with the members themselves in the interest which they show in attendance and attention to the matters which are brought before the Association. The Association has assumed a size and standing now which make the success of its meetings not only of consequence to the personal comfort and satisfaction of those attending, but the larger meetings and the character of the subjects which are brought before them have become of public interest, and the results of our meetings are reflected over the community, who will judge us and our merits and worth by the opinion which we ourselves form of each other.

There are doubtless here many members for no fixed or definite reason beyond the good fellowship and social enjoyment which they know they will find, and we all find here one of the relaxations and pleasures of life; but to insure this for the future imposes a serious duty upon us in regard to the election of members and the retention of those whose actions and methods are detrimental to the profession. We are all apt to be too good-natured in overlooking injurious things which do not seem to affect us individually. It is incumbent upon every member to scan and search the list of applications for membership as critically as he would the records of his own personal associates, and if there exists any proper cause why a man should not become a member, the reasons

for it should be placed before the Association. Putting to one side all personal feeling and prejudice, let every man vote for or against the candidates according to their merits as reputable and honest veterinarians.

I wish to urge upon you the importance of organizing and conducting local, county, and State veterinary associations upon principles in harmony with the United States Veterinary Medical Association, and I would like to see it become a requisite condition to qualify a man to become a member of this Association, that he should be a member in good standing of his county and State association. It should be that when we are asked by anyone what veterinarian we recommend in a distant locality that we can answer, "Any member of the United States Association you will find a reputable practitioner."

But I am occupying too much of your time, and I will leave it for you to learn for yourselves how faithfully most of your officers and those to whom you have intrusted the affairs of the Association during the last year have performed their duties.

The Comitia Minora will recommend to you various matters which have been duly weighed and considered by them as for the best interest of the Association.

The Chairmen of their respective committees will report in full the results of their year's labors.

The Secretary, Dr. Hoskins, will make you a report of his work, which I can assure you, from personal knowledge, has been most arduous, and which deserves the most grateful recognition on our part. To his labors the greater part of the present enthusiasm of our members is due.

From the reports of the Assistant Secretaries you will see that they have been unusually active in their work.

Among the papers to be presented, we have that on "Barren Mares," by Dr. Lyford; on "Rhachitis," by Dr. Williams; and others of interest to the practitioner, while in the Report of the Committee on Food Inspection, Dr. Bryden's paper on "Foreign Cattle Transportation and its Regulations," and in the discussion of Prof. Liautard's paper on "Veterinary Jurisprudence," postponed from last year, we have subjects of national importance which affect our agricultural products, our health, our wealth, and our commerce in animals, both at home and abroad.

I beg to thank you, gentlemen, most sincerely for the honor which you conferred on me by selecting me President of this Association for the last year, and as your representative for the moment, for you I thank the Local Committee of Arrangements, Drs. Walmer, Kilborne, Swedburg, Dougherty, Faville, Clement, and Martinet for their labors which have placed us in such favorable surroundings for a successful meeting, which I am sure this will be.

The following resolution was adopted: That our Association adopt an application blank.

Vouchers : *Degree.* *Degree.*
Degree, Member or Resident State Secretary of
the United States Veterinary Medical Association.

The list of applicants for membership then came under discussion ; the first considered were the names for Honorary Membership, and after a thorough examination of the names of Dr. Theobald Smith and Prof.

James Law, it was deemed best, by unanimous vote, that we do unfavorably recommend.

It was urged that our regular membership, being open to gladly receive worthy members of the veterinary and medical profession, that we would heartily consider with favor such names for active membership.

The list for application to regular membership was then considered, and the following names were favorably recommended :

Drs. J. T. Ryan, W. H. McKenney, J. T. Donnelly, E. D. Roberts, F. Brenton, J. C. Whitney, W. D. Daniels, E. P. Niles, W. B. Niles, John J. Millar, M. H. Reynolds, John A. Kenny, W. S. Mayo, H. A. Meisner, J. C. McNeil, R. W. Story, M. E. Knowles, J. P. Turner, E. J. Nesbitt, Joseph G. Hill, W. H. Berkmeier, H. H. Dews, James B. Paige, E. B. Ackerman, W. L. Labaw.

The names of Drs. A. M. Bigelow, W. E. Peterson, Edward P. McKenna, being improperly vouched for, were favorably indorsed, after being vouched for by Dr. J. T. Winchester.

The application of Dr. D. A. Cormack was withdrawn.

The name of Dr. Henry A. White was unfavorably considered, as well as those of Drs. W. T. McCoun and John Airth.

The name of Dr. G. W. Palmer was not entertained, owing to the filing of an apparent false statement.

The name of Dr. John A. Bell was laid over owing to his application lacking a proper voucher.

For non-payment of initiation fees and dues we recommend that the following names be dropped from the rolls :

Drs. E. M. Beckley, J. E. Gardner (Albert Hassall), reconsidered, J. S. Culbert, G. Grimshaw, F. C. Herbert, A. Jasme, with instructions to the Secretary that he be directed to remove from his letter-head the claim to membership in this Association ; H. C. Klicker, J. Morice, M. O'Connell, G. P. Penninan, Fred. Lamberton, T. E. Maloney, B. G. Orlopp, C. H. Peabody, I. T. Page, W. B. Rowland, S. L. Richards, J. W. Sallade, H. Whitney, William T. Walsh, W. H. Appel, Hara Taka Yokura, E. W. Roche, E. W. Rowland, George H. Roberts, R. L. Tucker, J. P. Wilson, Charles J. Weidner, Fred. Winant, A. C. Young.

It was recommended that the dues of Dr. J. Penniman be remitted to date.

Information being filed of a violation of the Code of Ethics by Dr. John T. Claris, the Secretary, on motion, was instructed to request him to make explanation of the same.

It was moved and seconded that we change the wording of the application blank as follows, strike out "References" and insert "Vouchers for."

On motion, it was moved and adopted that we adjourn until 9 A.M. of the 15th.

W. HORACE HOSKINS,
Secretary.

On motion, the report was received.

Dr. PETERS: Before accepting that report, do we understand that the Comitia Minora report unfavorably on the honorary membership of Dr. Smith and Dr. Law? I think some explanation is due the Association for such act.

The PRESIDENT: That question comes up for action later. You now have before you for your action the first recommendation of the Comitia Minora, which is, that the meeting of 1893, in Chicago, be an International one; that a committee of three be appointed to arrange for it and report upon the same at the next meeting.

Dr. CLEMENT: I move that the recommendation of the committee on that subject be accepted. It is very proper that the meeting of 1893 should be held in Chicago, and should be an International meeting. I have not given the subject much thought, but that is my impression just now. Dr. Berns seconded the motion. The question was put, and the motion was agreed to.

The PRESIDENT: The next recommendation is in reference to the application blank. Dr. Faust moved that the Association authorize the use of these blanks, which have been adopted by the Comitia Minora. The motion was seconded, the question put and agreed to.

The PRESIDENT: The third recommendation of the Comitia Minora is in reference to the action of the committee on the application of Drs. Smith and Law for honorary membership.

Dr. CLEMENT: It seems to me that we should be rather guarded in this matter. As far as Dr. Smith is concerned (I do not know anything about Dr. Law, never having seen him), he is perfectly willing and anxious to come into the Association as an active member, but so long as his name has been proposed as an honorary member it may be embarrassing, and perhaps not the proper thing to do to turn him down. I think he should feel probably as some of us felt in regard to the Medical Association; that his presence was not wanted and he would be rather out of place here. So far as he is personally concerned, he has done considerable for the profession, either directly or indirectly, as you choose to put it, in his special line. Whether we agree with his conclusions or not in all cases, the fact remains that he has done considerable work. I think we had better consider this thing fully before turning down a name like that. It would make it rather embarrassing in the future in proposing members. Perhaps some of us would have the names of men we should like to propose, and certainly we should not like to have them refused membership.

Dr. WINCHESTER: That calls for an explanation. I speak for myself, and others may do as they like. Dr. Smith is a young man, and there is nothing in our Constitution and By-laws against his becoming an active member of this Association. If he desires to become one he can

go through the regular course, as the rest of us have done, and undoubtedly his application would be favorably received. But to make an honorary member of anyone who sees fit to ask that honor I think would be throwing the honor away as a Society.

Dr. R. A. McLEAN: There is this further to be said in the line of Dr. Winchester's remarks: I assure you that the Comitia Minora gave thorough examination to Dr. Smith's case, and I have no doubt his name will be considered favorably if it comes through the regular form. We all had to work for our present standing. If an honorary membership in this Association were a gratuitous affair it would be an empty honor. We have had men who have worked for thirty years and who have grown gray-headed in the service, who could well be retired and promoted to honorary membership. Let us consider this an honorary degree as the H. F. R. C. V. S. is in the Old Country.

Dr. Peters agreed with Dr. Winchester and Dr. McLean on the subject.

The SECRETARY: The question of honorary membership should be one which individual members should consider very thoroughly before they submit the name. We should submit a name certainly that everyone is familiar with, and it should be a person from whom every member of our Association had received marked benefit, and he should be a man so situated in life as in some way to be unfit for active membership. We should not consult our personal wishes and desires in such matter to confer upon some personal friend or warm admirer an honorary membership in this Association. That has seemed to be the tendency in several directions which have already come to the notice of the Secretary.

Dr. CLEMENT: I quite agree with the spirit of the remarks made by Dr. Winchester, Dr. Peters, Dr. McLean and Secretary Hoskins, and I shall lay emphasis on what the Secretary has just said. But the point I wish to make in particular is, that members should be very careful in proposing people for honorary membership in this Association unless they have some particular reasons, and no member should propose the name of one unless he knows all about it. I feel pretty certain that Dr. Smith did not know his name was to be proposed for honorary membership. Honorary membership in this Association should be regarded as of high order, to be conferred upon those who have done or are capable of doing great service for the Association and the profession in general. I would suggest that Dr. Smith be informed that the Association would be very glad (although I do not know whether that would be in accordance with the Constitution) to have him as an active member.

Dr. McLEAN: I move that the report of the Comitia Minora in regard to the application of Dr. Smith be adopted.

The motion was seconded, the question was put, and the motion was agreed to.

The PRESIDENT: The next name to be acted upon is that of Dr. James Law.

The SECRETARY: The Committee unfavorably recommended him on the ground that Prof. Law is not too young a member to be identified with this Association, as he is in active participation in the work of the New York State Association, but because of the fact that he had been a member of this Association at a critical time in its history and saw fit to withdraw and shirk his part of the responsibility in sustaining the Association before the country. On that ground it was recommended that his name be unfavorably recommended.

Dr. CLEMENT: I move that the report of the Committee be adopted.

The motion was seconded, the question put, and the motion was agreed to.

The PRESIDENT: The next recommendation is in reference to the list of applicants favorably reported by the Comitia Minora.

Dr. McLEAN: I think that instead of going all over these names that it would be well for the Secretary to cast the ballot of the Association.

The PRESIDENT: It is proper that the names be read.

Dr. McLEAN: I move that the Secretary cast the ballot of the Association for the applicants for membership recommended favorably by the Comitia Minora.

The motion was seconded, the question put, and the motion agreed to, and the Secretary announced that he had cast the ballot of the Association in favor of the following:

J. F. Ryan (V.S., Montreal), Chicago, Ill. W. L. Williams, voucher.

W. H. McKinney (D.V.S., Chicago), Genesee, Ill. M. R. Trumbower, voucher.

J. T. Donnelly (V.S., New York College), Astoria, L. I., N. Y. R. A. McLean, voucher.

E. D. Roberts (D.V.S., Chicago), Jamesville, Wis. Joseph Hughes, voucher.

F. Brenton (V.S., Ontario), Detroit, Mich. J. Hawkins, voucher.

J. C. Whitney (V.S., Ontario), Hillsdale, Mich. J. Hawkins, voucher

W. D. Daniels (V.S., Ontario), Cardington, O. William R. Howe, voucher.

E. P. Niles (D.V. M., Iowa Agricultural College Veterinary Department), Ames, Iowa. S. Stewart, voucher.

W. B. Niles (D.V.M., Iowa Agricultural College Veterinary Department), Ames, Iowa. S. Stewart, voucher.

John J. Millar (V.S., Ontario), Sioux City, Iowa. J. T. Kennedy, voucher.

M. H. Reynolds (M.D., D.V.M., Veterinary Department Iowa Agricultural College, Iowa College of Physicians and Surgeons), Keosauqua, Iowa. S. Stewart, voucher.

John A. Kenny, (D.V.S., American Veterinary College), New York City. T. Birdsall, voucher.

W. S. Mayo (M.S., D.V.S., Chicago), Manhattan, Kan. Daniel Lemay, voucher.

H. A. Meisner (V.M.D., Veterinary Department University of Pennsylvania), Baltimore, Md. R. S. Huidekoper, William Dougherty, vouchers.

James C. McNeil (M.D., Veterinary Department University of Pennsylvania), Pittsburg, Pa. J. A. Waugh, voucher.

R. W. Story (V.S., Ontario), Princeton, Ill. Dr. Hollingsworth, W. L. Williams, vouchers.

M. E. Knowles (D.V.S., American Veterinary College), Terre Haute, Ind. W. Horace Hoskins, voucher.

J. P. Turner (V.M.D., Veterinary Department University of Pennsylvania), Fort Niobrara, Neb. W. L. Zuill, voucher.

Alfred M. Bigelow (V.D., Harvard), Norwood, Mass. J. B. Winchester, voucher.

Edward J. Nesbitt (American Veterinary College), Poughkeepsie, N. Y. A. Liautard, W. J. Coates, vouchers.

W. E. Peterson (Harvard Veterinary Department), Methuen, Mass. J. F. Winchester, voucher.

Joseph G. Hill (Ontario), Sennett, N. Y. Nelson P. Hinkley, W. G. Hollingsworth, vouchers.

Edward P. McKenna (Harvard Veterinary Department), Woburn, Mass. J. F. Winchester, voucher.

William H. Berkmeier (American Veterinary College), New York City. E. A. Parsons, T. Birdsall, vouchers.

Henry H. Dews (American Veterinary College), New Bedford, Mass. W. H. Brownell, voucher.

James B. Paige (Montreal), Amherst, Mass. F. H. Osgood, voucher.

W. L. La Baw (American Veterinary College), Springfield, Mass. A. Liautard, W. J. Coates, vouchers.

E. B. Ackerman (American Veterinary College), New York City. A. Liautard, W. J. Coates, vouchers.

Dr. FAVILLE: I move that the Secretary be instructed to cast the ballot of this Association for Drs. A. M. Bigelow, W. E. Peterson, and Edward P. McKenna, who being improperly vouched for were favorably indorsed, after being vouched for by Dr. Winchester.

The motion was seconded, the question put, and the motion was agreed to.

The Secretary cast the ballot as instructed.

The PRESIDENT: The next clause of the report is the withdrawal of the application of Dr. D. A. Cormack, followed by the recommendation of the committee of unfavorably considered applications of Drs. H. H. A. White, W. T. McCoun, and Dr. John Airth.

On motion, the report of the Committee was adopted.

The Secretary read from the report of the Comitia Minora as follows: "The name of Dr. G. W. Palmer was not entertained, owing to the filing of an apparent false statement."

On motion of Dr. McLean the action of the Committee was sustained.

The name of Dr. John A. Bell was laid over by the Comitia Minora owing to his application lacking a proper voucher. If anybody here would like to vouch for Dr. Bell I would like to have him ready for next year.

For non-payment of initiation fees and dues we have dropped a number of names. They have been given far beyond the time allowed by your By-laws and Constitution to pay their dues to the Association. I sent to some of these parties nine or ten bills with no apparent effect whatever, and the Comitia Minora recommend that their names be dropped from the rolls. They are Drs. E. M. Beckley, J. S. Culbert, J. E. Gardner, G. Grimshaw, F. C. Herbert, and A. Jasme, whom the Comitia Minora instructed the Secretary to direct to remove from his letter-head the claim to membership in this Association; also H. C. Klicker, Fred. Lamberton, J. Morice, T. E. Maloney, M. O. Connell, B. G. Orlopp, G. T. Penniman, C. H. Peabody, G. G. Pearson, J. F. Page, E. W. Roche, W. B. Rowland, E. W. Rowland, S. L. Richards, George H. Roberts, J. W. Sallade, R. L. Tucker, H. Whitney, J. P. Wilson, William F. Walsh, Charles G. Weidner, W. W. Appel, Fred. Winant, Hara Taka Yokura, and A. C. Young.

Dr. McLEAN: I move that the recommendation of the Comitia Minora be adopted.

The motion was seconded, the question put, and the motion was agreed to.

The SECRETARY: It was recommended that the dues of Dr. J. Penniman be remitted to date. He was one of the organizers of the Association, and advanced in years, and is so situated that he cannot attend our meetings.

Dr. Faville moved that the recommendation be adopted.

The motion was seconded, the question put, and the motion agreed to.

The SECRETARY: The Comitia Minora recommended that the salary of the Secretary be increased to \$200. I recommended before the Committee this raise in salary. Being one familiar with the arduous character of this position, I thought no one was in a better position to urge the matter. I had determined not to allow my name to come before you for re-election. In the last year I have sent out between four and

five thousand communications of different kinds, and I sent out nine hundred and fifty notices of this meeting in the last six weeks. The work of this Association has kept me out of bed until one and two in the morning. I retired at one o'clock last night and got up at five o'clock this morning in order to put the work in shape for this meeting. It is necessary for me to attend all meetings, and last year I used up my salary and fifty dollars besides in attending meetings. I think, as a stimulus to your incoming Secretary, that you should raise the salary to \$200. The dues and income of the Association reach anywhere from \$750 or \$800 a year, and probably the expenses, of such a Secretary as I have been, will not reach more than \$400 or \$500, and I think it is your duty, if you expect the work of this Association to be carried out, not as it has been done, but as it should be done, your new Secretary will well earn his \$200.

Dr. FAVILLE: I move to increase the recommendation of the Committee to \$250, and, if I am in order, I will also move that our present Secretary be given a life secretaryship in the Association as well as \$250 permanent salary.

The PRESIDENT: This increase has been based upon a careful calculation of income and expenses, so that it might be perfectly warrantable within the limits of the resources of the Association.

Dr. FAVILLE: It seems to me that the increased membership of this Association, and our increased income, with the increased labor which the Secretary of necessity must have placed upon him, and all that sort of thing, that \$250 is little enough for us to pay. According to our Secretary, if his successor is as economical as he has been, we will have two or three hundred dollars over our expenses. With the increased salary that the Comitia Minora has recommended there will be left a balance of \$200 or \$300 in our hands, and I do not think a portion of that money can be better spent than for compensating our Secretary for his arduous labors. I move that the recommendation of \$200 be increased to \$250.

Dr. WILLIAMS: I propose that we give a stated salary with his necessary expenses. We hold our meetings now at widely diverted points. Mr. Hoskins had to go to Chicago last year at considerable expense. We do not know who is to be the next Secretary or where the next meeting is to be held, and it occurs to me the better way to arrange this is to allow the Secretary his necessary travelling expenses and then allow him a salary besides—something which he could regard as a salary. According to the Secretary's statement his salary has proved a deficit. He has more than expended his salary in attending meetings.

The SECRETARY: I visited Washington without any instructions from you to look over the work of the local committee here, to see that our room was fit for the meeting, and that the hotel reception would be such

as we should have. I looked after the points upon which we have heretofore been tripped up. I also visited the New York Association, thinking we might draw some of their members and interest them in the National Association. Those things were not necessary for a Secretary to do, but my interest in the matter was such as to do it, and I did it at some expense.

Dr. McLEAN: I move that the recommendation of the Comitia Minora be adopted. The Committee went into this quite thoroughly, and until we find out exactly how well our new members are going to stick to us and pay their dues, we feel that \$200 is about as much as we could give, although it does not compensate the Secretary for his labor. I would like to add to the report that the Secretary be allowed to draw from the treasury the sum of \$50 for expenses incurred by him during the past year, that would leave the salary at \$200 and recoup the Secretary for his extra outlay last year.

The SECRETARY: I had recommended this increased salary solely that you might give your future Secretary the necessary stimulus in the matter. Any additional expense paid out by me has been gladly paid. The success of the National Association has been a thing very dear to me for a great many years, and ever since I have been a member. I ask that the amendment in regard to the \$50 be withdrawn.

Dr. MILLER: Nobody knows better than I of the arduous labors performed by our Secretary during the last year. He has spent many sleepless nights in doing the work of this Association. I know that, and I also know that he paid out during the last year more than double the amount he received from this Association. If he received to-day double the amount of his salary he would not be compensated for the money he laid out for this Association. He says, in the modesty of his nature, that he did all this for the good of the Association, and we take his word for it; but we do not think it proper or right that any man should be called upon to do that continuously while he continues as our Secretary, and I think the motion of Dr. McLean will prevail, and I hope the modesty of the Secretary will excuse him from opposing the motion.

The PRESIDENT: The motion of Dr. Faville, that the Secretary's salary be increased to \$250 is before you for action.

Dr. FAVILLE: I withdraw the motion.

The PRESIDENT: You have before you, gentlemen, an amendment to the recommendation of the Comitia Minora increasing the salary of \$200 to \$250. There is an amendment pending thereto authorizing the Secretary to draw upon the treasury for \$50 additional toward defraying the expenses incurred by him during the past year. Do I understand this to apply to future secretaries?

Dr. FAVILLE: The idea is to adopt the recommendation of the Comitia Minora, and to add thereto the authority to the Secretary to

draw \$50 from the treasury to cover expenses already incurred. This does not apply to anything in the future, but to cover outlays in the past.

The PRESIDENT: I think that comes under new business. You have now before you the motion as to the recommendation of the Comitia Minora in regard to the future salary of the Secretary.

The question was put, and the recommendation of the Committee was adopted.

Dr. HITCHCOCK: I rise to a question of privilege touching the question that came up in the report of those members who had just been suspended for non-payment of dues. I find the name of E. C. Beckett. Also when our Secretary read the names of those suspended, I think the first name was E. C. Beckett. I would like to know if he was suspended.

The SECRETARY: Dr. E. C. Beckett was not considered.

Dr. HITCHCOCK: I think Dr. Beckett will be here during this meeting, and if he is suspended for non-payment of dues it places him in an embarrassing position. I think if he comes here it will be with the intention of paying whatever he owes.

The SECRETARY: E. C. Beckett was dropped at Chicago. He had in the neighborhood of eleven bills sent him, to which he paid no attention, and was dropped at Chicago.

Dr. FAUST: We should consider when our Secretary has given repeated notices and they are not acknowledged that we are treated with contempt, and it is then high time to drop such members.

The PRESIDENT: The next order of business is the Report of the Committee on Intelligence and Education. (See under Reports.)

The Secretary announced that several photographers had made application to take the photographs of members of the convention at no cost to the Association, but that such members as wished a copy of the photograph could purchase the same. At this point (12.45 P.M.) the meeting took a recess until 2 P.M.

Afternoon Session.

At the expiration of the recess the Convention met. The President announced that the next order of business has the report of the Finance Committee. The report went over for the present and the President called for the report of the Committee on Diseases.

Dr. MICHENER: As Dr. Butler, the chairman of the committee, has not sent any communication to me as the second member of the committee, I take it that there is no report to be made.

The PRESIDENT: The next report in order is that of the Prize Committee. (No report was offered.)

The SECRETARY: I will here give notice that to-morrow I shall introduce in writing for the consideration of the Association, that it may be brought to a direct vote, a resolution as to whether we shall not raise the qualifications for entrance into this Association.

The report of the Special College Committee was called for, but its reception was postponed for the present. The next call was for the report of the Committee on Army Legislation.

Dr. MILLER: I beg leave to offer an apology. I have been unable to make any headway in the matter of Army Legislation, although I have done considerable work myself unassisted by other members of the committee. I am, therefore, unable to make any report that would be of any particular interest to the Association. I shall, however, read that little which I have collected together in my investigation of the matter, and will conclude by making some suggestions for the views of members who may be present as to future legislation. (See Reports.)

Dr. McLEAN: I move that the report of the Committee on Army Legislation be received and the committee discharged.

The SECRETARY: After all the work that has been done in the matter to discharge that committee! I think not.

Dr. MILLER: My recommendation was that a new bill should be framed, or amendments offered to the old one, in order that the work be continued, but I hope and pray that somebody else will be put in charge of its continuation.

Dr. FAVILLE: I move that the report be received and that the committee continue.

Dr. McLEAN: I ask whether it is not a fact that all committees are reappointed annually by the incoming President?

Dr. MILLER: I move that the report be received and adopted.

Dr. McLEAN: The report has already been received, but I want it adopted because in doing that we adopt the recommendation of Dr. Miller. A new committee will be appointed and a fresh bill drawn up to meet the objections of the present one.

The PRESIDENT: The present committee is in existence until a new committee is appointed.

Dr. McLEAN: My motion is to adopt the report of the committee and that the committee be discharged with thanks.

The Report of the Publication Committee was read and accepted. (See Reports.)

The SECRETARY: There is a suggestion I made that some notice should be taken of the publication of the proceedings of the Association. Whether it should be still left with me to make some arrangement with one of the journals for reprints or other arrangements be made. It is a question that ought to be considered under the head of the Publication Committee Report.

Dr. WINCHESTER: I move that this Association enter into a contract with the publishers of the *American Veterinary Review* to publish the full proceedings of this meeting; that we make some contract price with them on account of the interest they took last year in our deliberations and the publishing of our proceedings gratis.

Dr. WILLIAMS: I am opposed to any such arrangement. We cannot afford to show any favoritism between the two American veterinary journals, and I move that the Comitia Minora be instructed to have the proceeding and papers of this Association printed and distributed to members. Those taking an active part in these meetings should have a few extra copies. How many copies are needed?

The SECRETARY: We had three hundred and fifty copies from the *Review*, and I submitted to the *Review* a list of all our members. These three hundred and fifty copies, with the exception of thirty or forty, have disappeared from my shelves.

Dr. McLEAN: There are only two journals in the United States devoted to our profession, and I do not think we should make any invidious distinction. They will both publish the proceedings in full, and we should divide our patronage by getting three hundred copies from one and three hundred copies from the other.

Dr. MARTINET: I think the best way would be to purchase a certain number of copies from each of these publications, as suggested by Dr. McLean.

Dr. MILLER: I agree with Dr. McLean that we should make no invidious distinctions. I think the editorial staff of one journal is just as much interested in us as the staff of the other journal, and one has done as much for the advancement of our interests as the other. I therefore second the motion made by Dr. McLean.

The PRESIDENT: If you will allow me a suggestion, I will say that if the Association wishes to assume the expense of publication, why not do it on business principles, and ascertain where they could get the number of copies they desire at the cheapest rate.

The SECRETARY: The expense of the stenographer's bill at Chicago was divided, and my trouble was to furnish to each one of them the manuscript so that they could get their journal out at the same time with the same report. One paper was setting up the type while the other did not have the copy. I felt as much interest in one journal as in the other, and the thing became a source of trouble. We always allow fifteen or sixteen days to get the matter up in type, which is a short period.

Dr. McLEAN: I renew my motion that this Association purchase three hundred copies each from the *Journal* and the *Review* of the entire proceedings of this Association as printed in those publications.

Dr. WINCHESTER: Where are you going to buy them?

Dr. McLEAN: From the publishers.

Dr. CLEMENT: Are we to give these away to those who should subscribe to the journal, but who do not do so?

The SECRETARY: I have always taken advantage of the opportunity to send to the young men all our reports gratis.

Dr. BERNs: Last year was the first time that our reports were formulated in anything like proper shape. Heretofore we simply had a synopsis of our proceedings. The entire proceedings from beginning to end were duly recorded at the last meeting. It seems to me that simply a synopsis, which is all we could expect from either of the journals, is hardly sufficient for our purposes. As long as we have a stenographer here a full report should be printed and paid for by the Association independent of the journals. That would be the correct thing.

Dr. WILLIAMS: The proper thing is to have an entirely independent report of the proceedings of this Association that every member of this Association may have a copy, and then the editors of these journals can make extracts and such comments as they see fit. It seems to me that is in every way the better plan. I, however, take the *Review* and the *Journal*, and would not be without them. I prefer to have the comments of the *Review* and *Journal*, and then have a special copy that I could put upon my shelf as the report of this meeting of 1891.

Dr. CLEMENT: I move, as an amendment to the motion of Dr. McLean that the Publication Committee of this Association be authorized to have printed five hundred copies of the proceedings of this Association for distribution among the members without regard to either the *Journal* or *Review*. In other words, to have the printing done where it can be had the cheapest.

Dr. PETERS: I would suggest as a substitute that the Association allow the journal offering the lowest bid the privilege of publishing the proceedings of the Association.

Dr. MILLER: If Dr. Clement will offer his amendment as a substitute I will accept and vote for it.

Dr. McLEAN: Can you give us any idea what the cost will be?

The PRESIDENT: If you base it upon the proceedings of last year, I assume that the cost of printing the proceedings will amount to a little more. If the Association had undertaken to publish the proceedings itself last year the cost would have been about \$170 after they got the copy. I mean that is the cost not including the first expense.

Dr. CLEMENT: Cannot the Publication Committee have this printed by one of the journals. The journals are not disbarred. I simply mean for the Publication Committee to have it done wherever they could have the work done cheapest without regard to any particular journal.

The PRESIDENT: Exactly, the cheaper it is done the better for the Association.

Dr. MILLER: And then it does not appear on the minutes that we draw an invidious difference between one journal and then the other; let the committee get the work done where they can get it done cheapest. The question was put on Dr. Clement's motion, and it was agreed to.

The PRESIDENT: You have now before you the matter of the Special Committee on Central Organized Body, which made no report.

Dr. ROBERTSON: As the second member of that committee, I have nothing special to report in regard to the matter. It is a subject hard to understand exactly.

Dr. WINCHESTER: That committee has been in existence, if I remember rightly, four years. There never has been a report from it. It has never been demonstrated to this Society what the standing of that committee was. I therefore move that the committee be discharged and not another one appointed.

The PRESIDENT: It is a special committee, and if discharged it would require special action in order to appoint another. The question was put, and the motion of Dr. Winchester was agreed to.

The SECRETARY: Letters of regret have been received from Prof. McEachran, Prof. Liautard, Drs. Rouif, John S. Meyer, Hunter, Neabitt, Grange, Morris, Howard, and Schwartzkopff.

The PRESIDENT: You now have before you the Secretary's report.

Dr. WINCHESTER: I move that it be accepted, except as to the last clause.

The motion was agreed to.

The PRESIDENT: The discussion of the reports will come up in their proper order. The next report to be received is that of the Special Committee on Food Inspection. The report was read and received for discussion. (See Reports.)

The PRESIDENT: The next order of business is the report of State Secretaries. Several State Secretaries since morning have been dropped from the Association. Therefore, California is not represented. There is no representative from Kentucky. Dr. Cary, of South Dakota, is not present. Dr. Walmer is present, I believe.

Dr. WALMER: I have no report to submit.

The PRESIDENT: Georgia has no representative, having also been dropped. The Secretary will read the report of Dr. Grange, of Michigan.

The Secretary read the report.

No report was received from South Carolina, but the Assistant State Secretary, Dr. B. McInnes, had forwarded three photographs, one of which was a young calf of a few days old suffering from tetanus. It was a very striking picture. The others were of bitches suffering from tetanus, the sequel of the operation of ovariectomy.

The PRESIDENT: The next State represented here is that of Maryland.

Dr. CLEMENT: I have not prepared a report, and therefore have none to offer.

The PRESIDENT: The next State Secretary is Dr. Lowe, of New Jersey. (See Reports of State Secretaries.)

The Secretary read the report of Dr. Frinck, of New Brunswick, Foreign Secretary. (See Reports.)

The PRESIDENT: Have you any action to take on the reports of the Assistant Secretaries?

Dr. MILLER: I move that they all be accepted and filed.

Dr. McLEAN: Coupled with a vote of thanks.

The motion as amended was agreed to.

The PRESIDENT: The report from the College Committee, which was postponed in the order of reaching it, will now be received.

Dr. LYFORD: I have letters here from four or five colleges. The different colleges to which I put the list of questions were the American, New York, Ames, Kansas City, Montreal, University of Minnesota, Chicago, Toronto, Pennsylvania, and Harvard. Four answers have come. Why we should not have gotten answers from the nearest colleges to me I do not know. The communications from the New York and Toronto schools were the first to appear, although they were the farthest off. The questions I put to them for answer were first: What would you consider the necessary requirements for standard uniform veterinary education? Second: What would you be willing to do in the matter to obtain such a standard?

The Iowa school's report was that they were willing to do anything to increase their course, and would do what they could if it was in accordance with the rest of the schools. The State University of Minnesota has a three years' course of nine months each. They are just starting in, and they are now building a large hospital. That is one of the reasons why Prof. Schwartzkopff is not here.

The letters were read. (See Report of College Committee.)

The PRESIDENT: The next order of business is the election of the officers, which concludes the business for the day, to-morrow being set aside for the reading of papers.

Dr. WINCHESTER: I nominate for President Dr. J. H. Stickney, of Boston.

Dr. McLEAN: I second the nomination.

Dr. MILLER: I nominate Dr. R. S. Huidekoper for re-election.

Dr. HUHNE: I second the nomination.

Dr. CLEMENT: I nominate Dr. Williams.

Dr. BERNS: I second the nomination.

Dr. KILBORNE: I nominate Dr. Michener.

Dr. LOWE: I second the nomination.

The PRESIDENT: I have decided not to be a candidate, and you have before you the three names of Drs. Stickney, Williams, and Michener.

Dr. MICHENER: To make matters a little easier I withdraw my name, thanking you, gentlemen, for the honor. I could not possibly attend the duties of the office. I respectfully decline the honor.

Dr. MILLER: Before we go into the election of officers I want to rise to a question of privilege. I would like to know whether or not in the absence of a member of this Association such absent member can be nominated for the office of President and elected?

The PRESIDENT: There is certainly no regulation against it.

Dr. MILLER: It seems to me to be a very unwise thing to do. I have nothing against Dr. Stickney, and if here I would vote for him, but I think if a man has not enough interest in this Association to attend its meetings he ought not to be put up by his friends for President of the Association. I have the highest regard for him as a man, and would vote for him if he were here.

Dr. WINCHESTER: I nominated Dr. Stickney, knowing that he was not here; but if the gentleman will look over the records I think he will find that since the birth of this Association he has attended the meetings as regularly as any member of the Association. Because he is not here to-day, I do not think it disqualifies him. As a member of the Association he has done more than anyone else to sustain the work of the profession. He has taken the position that our friend Hoskins always has taken as regards the education of a man to be a veterinary surgeon, and he has been to us down in Massachusetts a pretty good guide.

Dr. MILLER: I grant all that has been stated by Dr. Winchester. No man in the profession has a higher regard for Dr. Stickney than I. My question was simply asked as to the precedent. I do not think it is the province of this Association to elect a man to the office of President of the Association who is not present at the meeting. I did it upon what I considered constitutional grounds. There is not a man in the profession to-day, not even Dr. Winchester himself, who has more respect for Dr. Stickney than I have; but as he is not here I cannot vote for him. I do not think we should elect him in his absence.

The SECRETARY: There is no member of the Association that it would give me more pleasure to vote for than Dr. Stickney, but Dr. Stickney for the last few years, because of infirmity of some kind, has not been able to mingle much with us, and we are now approaching an International meeting in 1893, and it is of the utmost importance at this time to elect as President a man that will lead this Association up to all the necessary qualifications for that meeting. I think it requires one who has been very closely identified with all the work that has been specially done during the last four or five years, and who has not only mingled with

us, but who has been active on committee work and been associated with the Comitia Minora, therefore I trust that our present presiding officer will not withdraw his name under the circumstances.

The PRESIDENT: Gentlemen, nominations are still in order.

Dr. WINCHESTER: Under those circumstances, I most respectfully withdraw the name of Dr. J. H. Stickney.

Dr. McLEAN: I second, with deep regret, feeling that the Association has expressed the sentiment concurred in by the mover of his nomination, and I withdraw my second.

Dr. BERNES: Then the only candidate for the time being, as I understand, is Dr. Williams.

Dr. WINCHESTER: Dr. Huidekoper and Dr. Williams.

Dr. McLEAN: I move that the nominations be closed. The motion was agreed to.

The PRESIDENT: I will appoint Dr. Winchester and Dr. Rayner as tellers. The tellers took their places, and the result of the ballot was announced as follows; Dr. Huidekoper, twenty votes; Dr. Williams, six votes; Dr. Michener, two votes. The election of Dr. Huidekoper was made unanimous.

The PRESIDENT: Gentlemen, I am very thankful to you for this honor. I meant what I said when I declined to be a candidate for the office of President. The special reason given is the only reason that I allowed my name to be used, namely, that during this year the work to be done will be largely preparatory for the Chicago meeting, which we have decided to make International in character, and I know probably more veterinarians personally than many members of the Association; I am willing to aid in the work.

Nominations for Vice-President are now in order.

Dr. WINCHESTER: I nominate Dr. W. L. Williams.

Dr. McLEAN: I second the nomination.

Dr. MARTINET: I move that the Secretary cast the ballot of the Association for Vice-President and Secretary and Treasurer in favor of the incumbents. The motion was agreed to.

Dr. McLEAN: Now, I move that the Secretary cast the ballot of the Association in favor of Dr. Williams for Vice-President. The motion was agreed to, and the Secretary cast the ballot as directed, and announced that Dr. W. L. Williams had been elected Vice-President.

On motion, the Vice-President cast the ballot of the Association for Dr. W. H. Hoskins as Secretary.

The SECRETARY: I again ask that I be relieved of the position.

Dr. MARTINET: I move that the Secretary cast the ballot of the Association for Dr. Robertson for Treasurer. The motion was agreed to, and the Secretary cast the ballot as directed, and announced that Dr. J. L. Robertson had been elected Treasurer.

Dr. WINCHESTER: Under the head of new business, I wish to revert to the subject that was discussed to-day with regard to refunding to our friend, Dr. Hoskins, the discrepancy of last year's salary. I move that he be refunded \$50.

The SECRETARY: I object to that. It certainly will not appear on the minutes that my asking you to enlarge the salary of the Secretary was a sincere thing, especially when you follow that up by making a donation which he has not asked. I still insist that I am not willing to serve again as Secretary, and think I have a right to be heard. I have served you three years, and that is as much as you ought to demand of any one man.

Dr. FAUST: I think the demand is just and right, but I also think that to accede to the demand would be fatal to the Society.

Dr. MILLER: I hope that the remarks of Dr. Hoskins will not be taken in the sense in which he has intimated. It is not that way. The President and myself know that the amount he received last year did not begin to pay his expenses in any way or shape. I know the hours that he has spent in correspondence. It has been almost impossible for me to get an audience with him at home for the reason that he was so busy with the duties of his office. It is not that we want to give him back pay, but simply to reimburse him for expenditures that he has made on our account, and I hope the motion will prevail. The question was put, and the motion made by Dr. Winchester was agreed to.

A motion to adjourn to meet again to-morrow at 10 A.M. was carried.

Secretary's Statement for Year ending September 14, 1891.

To annual appropriation for banquet and deficit . . .	\$78 00
To rental Auditorium Hall	60 00
To L. McLean, expenses, Committee on Tuberculosis . . .	18 00
To C. R. McKenzie, Dist. Pass. Agent, B. & O.	28 70
To Secretary, salary, one year	100 00
To printing	32 25
To postage, stationery, expressage, etc.	74 51

Total expenses for the year \$391 46

By collection of initiation fees and dues, banquet fees, two-thirds expense of stenographers, charges repaid by

Review and Journal \$654 50

Balance in Secretary's hands \$263 04

(Signed)

R. A. McLEAN,
THOMAS B. RAYNER,
AUSTIN PETERS,
Finance Committee.

SECOND DAY.—*Morning Session.*

Convention met pursuant to adjournment.

The Secretary called the roll, with the following result: Members present: Drs. Barron, Berns, Bryden, A. H. Baker, S. S. Baker, Claris, Clement, Dougherty, William Faust, Faville, Hinkley, Hitchcock, Hoskins, Huidekoper, Huhne, Kilborne, Kidd, Lyford, Lowe, Martinet, Michener, Miller, R. A. McLean, F. W. McLellan, Peters, T. B. Rayner, James B. Rayner, James L. Robertson, A. K. Robertson, Swedburg, Thompson, Turner, Wende, Weber, Winchester, Waugh, W. L. Williams, Meisner, and Knowles.

As delegates: Drs. J. C. Dustan, of New Jersey; R. G. Webster, of Pennsylvania.

As visitors: Drs. Isaiah Michener, John W. Gadsden, N. Rectenwald, H. S. Hogsett, H. B. Rayner, A. M. Farmington, W. H. Scrubey, W. Runge, William Somerville, F. E. Parsons, C. B. Robinson, J. D. Robinson, William B. Wertz, G. A. Jarman, and I. N. Krowl.

The PRESIDENT: There is still some unfinished business to be transacted.

The SECRETARY: I have received a letter from Dr. Whitney with a check for his back dues, and I move that we rescind the action of the Association yesterday in adopting the recommendation that he be dropped from the rolls, and further move that he be reinstated as a member of this Association.

The motion was agreed to.

The PRESIDENT: The Secretary has another matter to submit.

The SECRETARY: I have to offer the following applications properly authenticated for honorary membership: William H. Welch, M.D., Professor of Pathology, Johns Hopkins University, engaged for the past four years in the investigation of infectious diseases of animals, especially of swine, indorsed by the members of the Maryland State Veterinary Society. Proposed by Dr. A. W. Clement and seconded by Dr. Rush S. Huidekoper.

For regular membership: Drs. I. N. Krowl (American Veterinary College), Passaic, N. J. Vouchers, J. F. Winchester, Austin Peters William B. Wertz (Veterinary Department University of Pennsylvania), Philadelphia, Pa. Vouchers, R. S. Huidekoper, S. E. Weber. A. M. Farrington (Cornell Veterinary Department), Washington, D. C. Vouchers, Charles B. Michener, William F. Howe. Fred. W. Ashe, (Chicago), Chicago, Ill. Vouchers, A. H. Baker, S. S. Baker. Theobald Smith (Albany Medical College), Washington, D. C. Vouchers, Charles B. Michener, W. L. Williams. F. K. Chaffee (Chicago), Chicago, Ill. Vouchers, A. H. Baker, S. S. Baker. H. W. Hawley (Chicago), Chicago, Ill. Vouchers, A. H. Baker, S. S. Baker. G. Allen

Jarman (American Veterinary College), Chestertown, Md. Vouchers, A. J. Thompson, J. A. Huhne.

Dr. Butler presented the report of the Committee on Diseases. (See Reports.)

The SECRETARY: I have the great pleasure of announcing the application of Dr. Theobald Smith for membership.

Dr. KILBORNE: If it is in order, I volunteer the information that if any members of the profession would like to see the Texas Fever Entozoon they can do so by calling at the laboratory of Dr. Smith, who will gladly show it to them.

Dr. McLEAN: In accordance with the notification given yesterday, I desire to offer now, for consideration at the next meeting, the following amendment of the By-laws.

Article I. reads that "any applicant for membership shall have his name proposed in writing by a member of the Association in good standing, who shall furnish evidence of the fact that he is, first, a graduate of a regularly organized and recognized veterinary or medical school; second, that he is of moral and reputable business methods."

The proposed amendment is to strike out that article except the last clause and substitute this:

"Article I. Any applicant for membership shall submit his name upon one of the Association's application blanks, duly vouched for by one or more members of the Association, or by the resident State Secretary of his respective State. He shall be a graduate of a regularly organized and recognized veterinary school, which shall have a curriculum of at least three years, of six months each, specially devoted to the study of veterinary science, and whose corps of instructors shall contain at least four veterinarians. If of a medical school, a similar curriculum as to time shall prevail."

This alteration to go into effect after the annual meeting of 1892; it shall not be retroactive nor apply to applicants who were college matriculants prior to its passage.

The PRESIDENT: I will ask Dr. Kilborne to repeat his invitation, as there seemed to be considerable interruption at the time; I do not think everyone heard it.

Dr. KILBORNE: I simply announced that if any member should like to see the Texas Fever Entozoon, and will call at the laboratory of the Bureau of Animal Industry of the Agricultural Department, I know that Dr. Smith will gladly show it to him. I would also say that if any of the members of the profession would like to see the blood of Texas Fever animals, we have several chronic cases at the station here at present, which are open for their inspection.

The PRESIDENT: We will now hear the report of the Finance Committee.

Dr. Rayner read the report as follows, which was received and approved:

James L. Robertson, Treasurer, in account with the United States Veterinary Association.

Balance on hand, September 16, 1890	\$703 43
Paid Bennett, Edwards and Pettit, stenographers	\$81 50
October 10, 1890, paid Chairman R. S. Huidekoper, Committee on Legislation	166 50
	<hr/> 248 00
	\$455 43
In bank	\$447 18
In Treasurer's hands	9 25
	<hr/> \$455 43
Received from Secretary	36 81
	<hr/> \$492 24
Balance due per audited account	\$492 24
In hands of Secretary, Sept. 1, 1891	263 04
	<hr/> \$755 28

Approved,

R. A. McLEAN,
THOMAS B. RAYNER,
AUSTIN PETERS,
Finance Committee.

The SECRETARY: I have the following charge preferred by Dr. Faust: I herewith prefer charge against Dr. John T. Claris, of Buffalo, N.Y., for manufacturing proprietary and brevet medicines and unprofessional methods of advertising, as per proofs at hand (proofs filed), and would recommend that his certificate be withheld.

Signed,

JOHN FAUST,
Poughkeepsie, N. Y.

The PRESIDENT: The charge will be referred to the Comitia Minora and go through the regular course.

If there be no further new business we will proceed with the reading of papers.

Dr. LYFORD read his paper on "Barren Mares."

Dr. BRYDEN read his paper on the "Transatlantic Cattle Trade, and its Regulation, from a Veterinary Point of View."

Dr. MICHENER: I have the pleasure of extending to you a hearty and cordial invitation from Secretary of Agriculture Rusk to make a visit to the Department. You will be able to see much to interest you in many ways. The invitation embraces the experiment station under charge of Dr. Kilborne, a member of this Society. You will be able to see the clinical work he has done. Everything connected with the Department we would be glad to have you investigate. The Secretary

told me to be very particular to ask each and every one of you personally to come, and I take this means of doing so.

Dr. FAUST: At what hour?

Dr. MICHENER: Any time before 4 P.M.

The Convention took a recess until 1.30 P.M.

Afternoon Session.

The Convention at 1.30 P.M. resumed its session.

Dr. Williams read his paper on "Rhachitis."

Dr. R. S. Huidekoper then read his paper on "The Identification of Animals."

Dr. LOWE: Before we proceed with the discussion of papers I would like to refer, if it is in order, to an invitation that we have received to-day, as there should be some action taken on it, and that is the invitation of Dr. Michener. It may be too late to-day, but we have received a very kind invitation from a high authority through Dr. Michener, to visit the buildings of the Agricultural Department, and I think it would be fitting and proper to accept Secretary Rusk's invitation and visit the buildings referred to in a body, and I would make a motion to that effect.

The VICE-PRESIDENT: The motion would scarcely be in order at this time. It is too late now.

Dr. LOWE: I refer to to-morrow morning. I make the motion that this Association accept the invitation of Secretary Rusk as made through Dr. Michener, and we visit the Department to-morrow morning at 10 o'clock as a body.

The motion was agreed to.

The Secretary announced the application for membership of G. Allen Jarman, of Chestertown, Md.

The President announced the Board of Censors for the following year:

DR. J. T. WINCHESTER,

DR. WILLIAM DOUGHERTY,

DR. R. A. MCLEAN,

DR. A. LIAUTARD,

DR. T. B. RAYNER,

DR. J. H. STICKNEY,

DR. OLOF SCHWARTZKOPFF.

The Secretary moved that the Association extend thanks to the Washington Local Committee and the Baltimore Committee, and the proprietor of Willard's Hotel for the courtesies extended and the reception on the whole given us by the entire community.

The motion was agreed to unanimously.

At 5.30 P.M. the Convention adjourned *sine die*.



PAPERS
READ AT THE
TWENTY-EIGHTH ANNUAL MEETING
OF THE
UNITED STATES VETERINARY MEDICAL ASSOCIATION,
HELD AT WASHINGTON, D. C.,
SEPTEMBER 15 AND 16, 1891.

BARREN MARES.

By C. C. LYFORD, M.D., D.V.S.

THE subject of sterility, or barrenness in mares, is of vastly greater importance than one would at first be led to suppose. Only those who are actually engaged in the breeding business, or are professionally called to treat such cases, can comprehend the extent, as well as the serious nature of many of these complications. Besides, in a pecuniary point of view, it is of the greatest importance to the owners of studs, as well as of mares, as very often the most valuable animals used for breeding purposes are practically of no use outside of the harem, and as a consequence, are a source of expense without any returns; when on the other hand they should be a source of revenue, often of the highest character.

Successful fecundation is generally looked upon as a sure result of coupling the male and female sex at a certain period. Fleming says: "Successful fecundation, however, is not always the case, and in some species, particularly the equine, sterility, temporary or permanent, in the female, is far from being uncommon, and is sometimes serious."

The same writer says that in the studs of France the fruitful mares are 59.57; at the Haras of Pin, during a period of twenty years, there was a percentage of 68.27 fecund mares, abortion 5.06. This would leave about 64.82 to have colts. These figures indicate that only one-half, or at the most, two-thirds, of the mares produce foals. Quoting from Fleming's *Obstetrics*: "Sterility may depend upon organic or physical causes, and may amount to permanent impotence, more particularly when congenital and located in the generative apparatus. Monstrosities, hermaphroditities—animals in which one or more important organs of the sexual apparatus are absent, and hybrids—are generally permanently sterile."

"Prolonged continence and old age are not infrequent causes of infecundity, as is witnessed in mares which have worked for many years in towns, and have then been transferred for breeding pur-

poses." "It may likewise be due, though temporarily, to premature or tardy coition, when the generative organs are not in a physiological condition for conception or when they are in an irritable, abnormal state. Under-fed or over-fed animals generally do not breed so readily as those which are in moderate condition—fat animals are especially unfruitful; excitable, vicious mares are less likely to procreate than those which are of an equable and gentle disposition. The latter are often impregnated at one attempt; and it has been observed that with mares accustomed to work, active exertion, even to produce fatigue before being put to the horse, is favorable to conception. So it is that the Arab submits his mare to a severe gallop, and brings her almost breathless before the stallion, when, the act being accomplished, he leaves her quietly at rest for some hours."

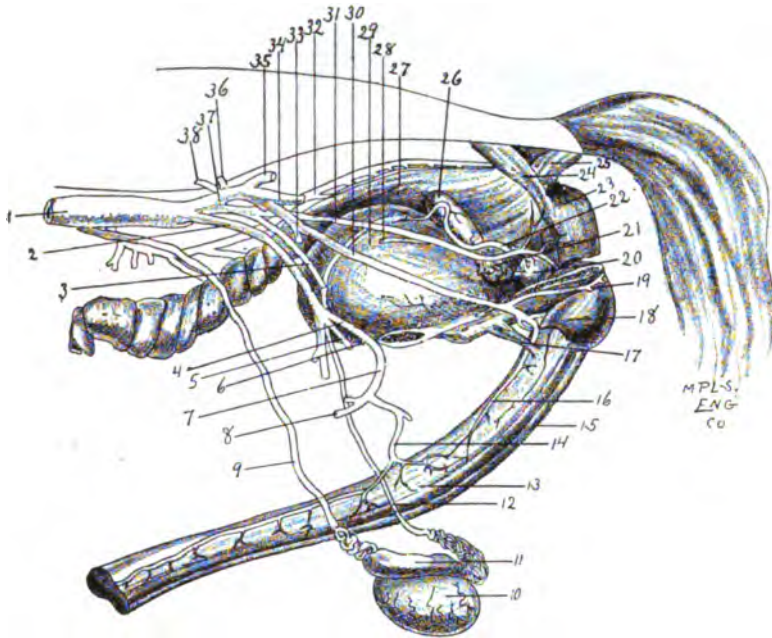
I have known of one case where of a litter of six boar-pigs, four were fed sugar and molasses to hurry up growth, after which all four proved to be barren, while the two that were turned out on ordinary feed were productive. Again, various diseased conditions of the generative organs, as well as general derangements, may also prove antagonistic to fecundity. There may be disease or alterations in the ovaries, Fallopian tubes, uterus or vagina, which will hinder conception; and if any material obstacle to the contact of the spermatic fluid with the ovule be present in these parts, fecundation cannot take place. Tumors of various kinds in this region are not infrequent causes of sterility. Rueff and others have observed an imperforate, dense and tough hymen to be a cause of infecundity in the mare.

In all of these conditions a careful examination should be made, as removal of the obstacle to generation may be quite within the scope of surgical or medical measures. More particularly is this the case when the obstacle is related to some abnormal condition of the cervix uteri, a circumstance more common than is generally supposed. In rare instances dilatation may require to be effected by a cutting instrument, but this should not be resorted to until the simpler and safer means have failed.

Before taking into consideration the diseases to which the organs are subject, I will notice, briefly, the anatomy of the parts, both male and female, and their physiological functions.

ANATOMY OF THE ORGANS OF GENERATION.—The penis, not only supports the greater part of the excretory urinary canal, but also transmits the sperm of the male.

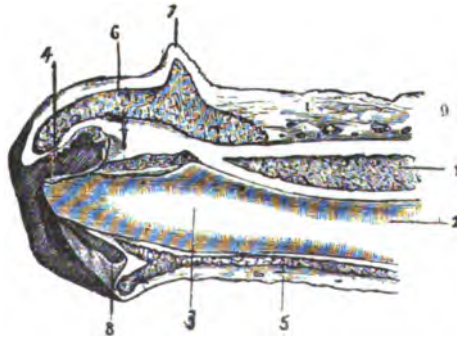
FIG. 1.



Male Pelvis. (CHAUVEAU.)

1. Posterior aorta; 2. External iliac artery; 3. Umbilical artery; 4. Prepubic artery; 5. Deep femoral artery; 6. Posterior abdominal artery; 7. External pubic artery; 8. Subcutaneous abdominal artery; 9. Spermatic artery; 10. Testicle; 11. Epididymis; 12. Vas deferens; 13. Penis; 14. Anterior dorsal artery of penis; 15. Urethral tube; 16. Posterior dorsal artery of penis; 17. Suspensory ligament of the penis; 18. Erector penis; 19. Artery of the corpus cavernosum; 20. Cowper's gland; 21. Prostate gland; 22. Vesico prostatic artery; 23. Sphincter ani; 24. Retractor penis; 25. Suspensory ligament of rectum; 26. Vesiculæ seminales; 27. Rectum; 28. Ureter; 29. Urinary bladder; 30. Obturator artery; 31. Internal pubic artery; 32. Posterior mesenteric artery; 33. Iliaco-femoral artery; 34. Gluteal artery; 35. Lateral sacral artery; 36. Last lumbar artery; 37. Internal iliac artery; 38. Second last lumbar artery.

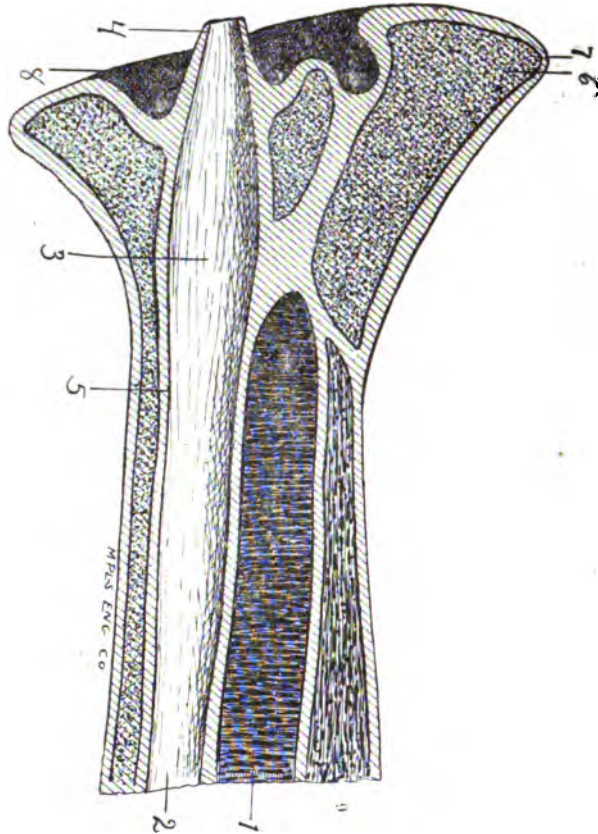
FIG. 2.



Longitudinal section of the free extremity of the horse's penis in a relaxed state.

1. Erectile tissue of the corpus cavernosum; 2. Urethra; 3. Fossa navicularis; 4. Urethral tube; 5. Erectile tissue of the urethra; 6. Erectile tissue of the glans; 7. Corona glandis; 8. Urethral sinus; 9. Integument and bloodvessels of penis.

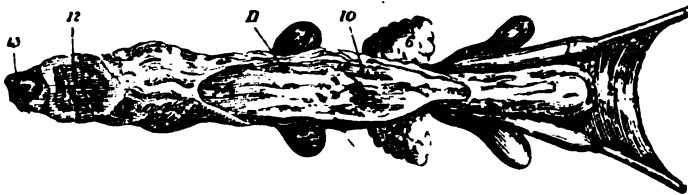
FIG. 3.



Longitudinal section of the free extremity of the horse's penis in an erect state.

1. Erectile tissue of the corpus cavernosum; 2. Urethra; 3. Fossa navicularis; 4. Urethral tube; 5. Erectile tissue of the urethra; 6. Erectile tissue of the glans; 7. Corona glandis; 8. Urethral sinus; 9. Integument and bloodvessels of penis.

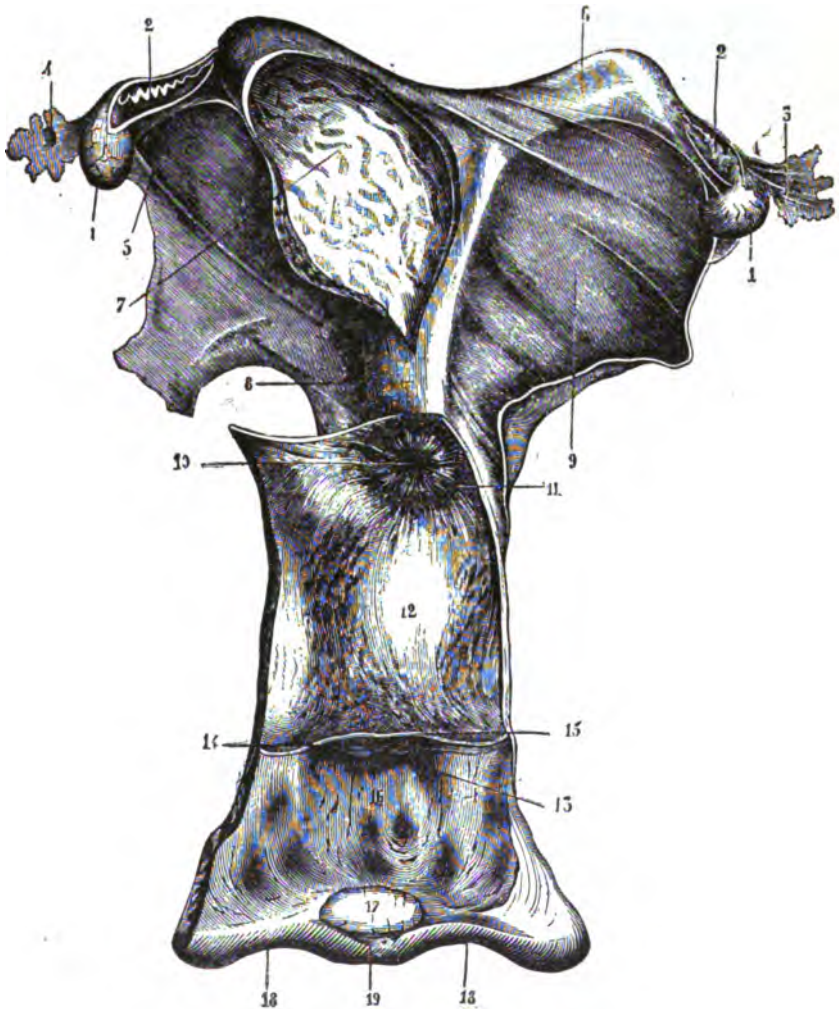
FIG. 4.



Bladder and intrapelvic portion of urethra opened from below.

1. Vas deferens; 1' Bulbous part of the same; 2. Peritoneal fold lining the vasa deferentia; 3. Bladder; 4. Vesicula seminalis; 5. Orifices of ureters; 6. Prostate; 7. Verum montanum with orifices of ejaculatory ducts; 8. Orifice of prostatic vesicle; 9. Cowper's glands; 10. Orifice of ducts of prostate; 11. Orifices of ducts of Cowper's glands; 12. Corpus cavernosum; 13. Corpus spongiosum with urethra in its centre.

FIG. 5.



Generative organs of the mare, isolated and partly opened.

1. Ovaries; 2. Fallopian tubes; 3. Pavillion of the tube, external face, 4. Pavillion of the tube, inner face, showing the opening in the middle; 5. Ligament of the ovary; 6. Intact horn of the uterus; 7. Horn thrown open; 8. Body of the uterus, upper face; 9. Broad ligament; 10. Cervix, with its mucous folds; 11. *Cul-de-sac* of the vagina; 12. Interior of the vagina, with its folds of mucous membrane; 13. Urinary meatus and its valve; 14, 15. Mucous fold, a vestige of the hymen; 16 Interior of the vulva; 17. Clitoris; 18. Labia of the vulva; 19. Inferior commissure of the vulva.

The penis proper consists of the corpus cavernosum, extending to and forming the bulb, tapering gradually at the anterior extremity of the penis, occupying the upper surface and divided by a sep-

tum into two lateral halves ; grooved on its under surface for the corpus spongiosum and urethra. The corpus spongiosum encloses the urethra, extending from the crura posterior passing to the external extremity, which expands to form the glans.

A review of the anatomy can best be made by reference to Figs. 1, 2, 3, 4 and 5.

PHYSIOLOGICAL CONDITIONS OF COPULATION.—It will be necessary to describe the physiological conditions of copulation to show upon what depends the normal action of the respective organs, male and female, during the act of coition. That the male organ, the penis, should be erect is necessary, and that the glans should vary considerably from their normal state is also essential. It will be seen by reference to Fig. 3 that the glans and penis assume the form of a valve and piston. The enlarged glans should fill the transverse diameter of the vagina so completely as to withdraw and expel the air, thus forming a vacuum within the cervix and uterus, and in case the cervix is kept sufficiently open and retained in the centre of canal, either by natural or artificial means, so that the urethral sinus of the glans shall fit the corresponding posterior surface of the cervix, and that the projecting end of the urethral tube may approximate closely or even fit into the opening of the os. Accordingly, should no obstruction exist between vagina and uterus, these conditions assure a complete injection of semen into the cervix and uterus, and as the glans assumes its natural size by its withdrawal from the vagina, allowing air to pass into the uterus, it practically assures the access of seminal fluid.

It is evident that a variety of influences may interfere with the performance of the natural process of fecundation. For its accomplishment, four things are necessary :

1. The possibility of the entrance of seminal fluid into the uterus.
2. The possibility of the production of a healthy ovule.
3. The possibility of the entrance of the ovule into the uterus.
4. The absence of influences in utero destructive to the vitality of the semen and preventive of fixation of the ovum upon the uterine-wall.

Should these four conditions exist no animal will be sterile. She may not bear a foal, but the incapacity may attach to the male and not to her.

The special causes of sterility, or those interfering with these conditions, may thus be presented :

1. *Causes preventing entrance of semen into uterus.* *a.* Absence of the uterus or vagina; *b.* Persisting hymen; *c.* Vaginismus; *d.* Atresia vaginae, or complete obliteration; *e.* Occlusion of cervical canal; *f.* Conical shape, elongated cervix; *g.* Patulous os and flaccid or flabby condition of uterus; *h.* Endometritis, or leucorrhœa; *i.* Polypi, or fibroids; *j.* Flexion of uterus; *k.* Very small os internum; *l.* A curtain of membrane, either, or both, external or internal to cervix; *m.* Equine syphilis.

2. *Causes preventing the production of a healthy ovule:* *a.* Chronic ovaritis; *b.* Cystic disease of both ovaries; *c.* Cellulitis or peritonitis, obliteration of Fallopian tubes; *d.* Absence of ovaries; *e.* Hemorrhage into ovaries; *f.* Undeveloped state of ovaries; *g.* Atrophy of ovaries from old age.

3. *Causes preventing passage of ovum into uterus:* *a.* Stricture or obliteration of Fallopian tubes; *b.* Absence of Fallopian tubes; *c.* Detachment and displacement of Fallopian tubes.

4. *Causes destroying vitality of semen or preventing fixation of impregnated ovum:* *a.* Corporal or cervical endometritis; *b.* Membranous dysmenorrhœa; *c.* Menorrhagia or metrorrhagia; *d.* Abnormal growths; *e.* Areolar hyperplasia.

ABSENCE OF UTERUS OR VAGINA.—I have met with but one case of absence of the uterus. During the summer of 1872 a young heifer showed signs of rut, and having a bull much larger than she was it was not surprising to have her look droopy after copulation, especially as she was pushed through an ordinary board fence at that time. The heifer was allowed to stand around and attend to herself some three or four days, during which time she continually strained as if to urinate, occasionally passing a small quantity of blood. Having killed her about the fourth day I made an autopsy, finding the abdominal cavity containing several gallons of urine and a hole through the anterior portion of the bladder, showing that the penis had passed through the meatus urinarius and ruptured the bladder. Two small congested ovaries were found, but no uterus.

Persisting hymen. I have met with quite a number of cases of this kind, and in most of these it was thicker than natural; some of the cases requiring considerable force to rupture the membrane.

Vaginismus, or hyperæsthetic state of the os vagina, which results in spasms of sphincter. These cases are by no means rare, and are a common cause of sterility. It not only interferes with the entrance of the male organ, because of the pain induced, but prevents

the seminal fluid from getting into the uterus, as the stallion in these cases is usually prevented making a closer cover, beside the spasmodic condition completely closing the cervix.

Atresia of the vagina is not very common in mares, and then follows laceration, or an organization of inflammatory lymph. These conditions, however, appear very common in cows; more often following the first calf than subsequent cases. The treatment is generally unsatisfactory, requiring instruments and surgical treatment which are often of no avail, the results being anything but satisfactory.

Occlusion of cervix or rigidity of os uteri. According to Fleming, "occlusion of the cervical canal may be due to spasmodic conditions of the muscle and cervix." If, however, there be hypertrophy in this organization, or rigidity, then an operation will be necessary.

Both rigidity and spasmodic condition of the os uteri are of very common occurrence, and are liable to be associated with many of the other troubles of the female generative organs. The spasmodic condition may be simply a consequence of irritation elsewhere. This condition is most common in young mares that have never conceived; but I have met with one case of rigidity when the mare was twenty-three years old and was the dam of several colts. I have also met with the spasmodic condition in some cases during one heat, while at the next period it had entirely disappeared. This will, I think, account for many of the cases which have been served repeatedly during a season, and all at once conceive by a single leap from another stallion or even the same one.

Conical shape of cervix and elongated os uteri is a very common cause of infecundity. By its bending on itself it may not admit the seminal fluid through the canal, and as a rule completely prevents it. This state of affairs not only causes trouble with the breeding of mares, but also in the human family. Thomas, on *Diseases of Women* says, "My experience leads me very positively to the conclusion that excepting endometritis, this is the most common of all causes of sterility, and fortunately remediable." "The treatment recommended varies somewhat in the human family with the length of cervix from dilatation, bilateral operation and amputation." It is very apparent with these conditions in mares that the cervix does not draw down and become flat and open, as it should do when the vagina "bellows up," or become rigid, as it should ordinarily during copulation. For these reasons the cervix is left projecting into the vagina to the extent of two or three inches; consequently the glans penis presses it

to one side during the act of copulation, and there is little or no chance for the semen to get into the uterus. When the pressure is removed the cervix projects into the vagina, thus preventing the semen from entering. Right here I will say it is not necessary for the cervix to be tense and closed, for I have known many cases where the cervix was long, loose, and flabby, with an opening sufficiently large to admit two fingers, and still the mare failed to conceive until artificial means were used. I wish to cite but two cases here of the tense or closed os—one, Belvedere by Mambrino Patchen, another, Gypsy Queen by Polanius—and one case of elongated, patulous cervix in a mare of my own, Mabel H., 2:26, by Col. West, 2579. In regard to the first two cases I will quote from the letters received concerning them. Byron G. Kimball, of Maple Stock Farm, Bradford, Mass., says: "The mare, Belvedere, I brought of William Trumbull, of New York City, for Col. H. A. Hale, of Bradford, and sold her at a sale in Boston, where she was bought by W. H. Phelps of Minneapolis. I had bred this mare according to my books on an average of twice a month for twenty-seven months with Warder, Hudson and various other stallions. I tried an impregnator on her, but it did no good. It was rubber, but more bell-shaped than yours." Dr. O. J. Evans, of Evansdale Stock Farm, Minneapolis, Minn., says: "Having used your impregnator on my Mambrino Patchen mare Belvedere, nineteen years old, that was bred by Mr. Henry Hale, of Bradford, Mass., to Warder by Belmont and to Hudson by Kentucky Prince, and by H. W. Phelps of Minneapolis, Minn., to Bayardo at least four times, all without impregnation, and having succeeded in getting her in foal during first heat by Red Chieftain, using the impregnator, and having used it on several other mares that had refused to breed one or more seasons, among them, Gypsy Queen, by Polanius, she being a mare twelve years old, and had been bred to different horses at least four seasons without becoming in foal, I must also state that neither Belvedere nor Gypsy Queen had ever been in foal until this season, and both are now sure."

F. W. Muckey, Minneapolis, Minn., says, "I owned the bay mare Gypsy Queen, and bred her two years without success. I then sold her to J. K. Sidall, of Minneapolis, thinking her barren, as she was a young mare and we had used every means then known to the profession. Since then, she has become the property of Dr. O. J. Evans, and I understand he has been unsuccessful until he used your 'impregnator,' and with the first trial succeeded in getting her in

foal." In regard to the case of elongated patulous cervix in Mable H., she was a mare who at the age five years had had a filly by Phallas 2.13 $\frac{1}{2}$. The next two years she was not stinted, but was returned to Phallas for the season of 1887 and 1888, but failed to conceive. In February 1889 she was sent to T. B. Merritt's Farm at Rosemont, Minn., and was stinted to Nutwood Mambrino until June 12th, without any good results. June 13, 1889, I again had her returned to Nutwood Mambrino, using an impregnator, from which she conceived; the result being a chestnut foal, born June 13, 1890, now registered Vol. X. Wallace Trotting Register as Wood-not 15234.

Patulous os or flabby condition of the uterus. These cases are very common in mares, generally in those which have had foals or aborted, but are sometimes seen in mares which have never been in foal or even stinted. The cervix is very loose and flabby, which is often more or less associated with a like condition of vagina and uterus; the os at times being so open as to admit the entire hand with little or no resistance. I had a case of this kind at the Bruce Stock Farm, Rosemont, Minn. The mare had aborted over a year before, since which time they were unable to get her in foal. She appeared otherwise in good health, worked every day and kept in good heart and flesh. I had the uterus and vagina flooded daily for five weeks, using for an injection, alternate days, carbolic acid 1:100 warm water, corrosive sublimate 1:1000. This was continued until signs of heat returned the second time, when, after being stopped, her cervix was swabbed out with iodoform ointment 1:10, and the third day was served. The os had so contracted that the large sized impregnator went in with difficulty, though the dilator was used. When examined before treatment her cervix would admit with ease the entire hand; the uterus and vagina being especially flabby. The mare has since failed to receive another embrace, though repeatedly tried for over three months, and shows every indication of being in foal.

Another case of this kind was one of my own, Nellie Gray, Dam of Mabel H.; a mare twenty years old, having failed to conceive for five years—and having aborted six years ago—though being repeatedly stinted to various stallions before I purchased her in 1889. I had her stinted during the season of 1889 to Col. West, 2579, and during the season of 1890 to Morrill Tyrant and Greymont, the last two being young stallions, but to no avail. During the fall of 1890 I examined her, finding the cervix not only sufficiently open to

admit easily three fingers, but the cervix was torn on its upper portion, and on the right side of *cul-de-sac* of the vagina, from the vagina wall to cervix, was a complete honeycomb, having evidently been lacerated at various times during copulation. Having decided to give her tonic treatment and regular exercise, she was left without further stinting until April, 1891, when I examined her and found the vagina and cervix nicely contracted and in heat. She was then stunted to a three-year old son of Jersey Wilkes, from which she is now surely in foal.

Various modes of treatment have been tried for the lax, weakened condition of cervix and uterus, which may be classed as constitutional and local. The former class of remedies I have not given a thorough trial, though the cases on which I have used them indicate favorable results. These consist of general tonics and especially stimulating and invigorating aphrodisiacs, such as phosphorus, cannabis indicus, nux vomica, ergot and arsenate of iron. Also some palmetto fld. ext.

Local treatment, such as swabbing cervix with tr. iodine and iodoform, as well as styptic, astringent, and antiseptic injections have apparently proven beneficial in a number of cases.

I believe that electricity will prove itself very useful in these cases, especially where applied locally to the cervix, vagina or uterus.

Endometritis fills the uterine canal with a thick tenacious mucus and often prevents the entrance of seminal fluid or destroys its vitality. We meet with quite a good many of these cases in the mare, and they vary very materially in the consistency of the secretions. Endometritis and resulting leucorrhœa are the most unsatisfactory diseases we have to contend with in the treatment of barrenness. In the first place, it is far from being an agreeable task, and as the cases are generally of long standing when we get them, they are not only the more difficult to cure, but the time and expense often exceeds the value of the animal. The mare as rule is emaciated ; cannot stand hard work, and, though her appetite is often good, fails to put on flesh. The discharge is of a viscid, glassy or creamy character—often with a peculiar odor, which we require to smell but once to remember, especially in every case you get to attend at college, when you have to depend upon your fellow-students to assist you in treatment, particularly the injections, the smell stays by you often for a day or more, no matter how often you wash or use disinfectants. I am glad to say that the balance of my cases have been looked after by

the owners or persons in charge, though it is often a great deal of trouble to get them to follow your instructions and get anything like favorable results. Mineral and vegetable tonics and mineral acids have generally proven beneficial; antiseptic injections, not too strong, also perox. hydrogen, as there is some danger of overdoing. Unless the os is flaccid and well dilated it is better to keep the parts open to allow drainage, as I have known of cases when fluid was retained from one day to the next, the horns of the uterus often being relaxed.

Polypi, fibroids and moles are not very common in my experience, having met with but three cases, all of them being outside of cervix, and were very easily cured by excision, styptic and antiseptic dressings.

Flexion of uterus and cervix is not common. In this, the os is turned to one side, and during copulation it would be pressed against the wall of the vagina, entirely obstructing the passage to the uterus. Huntress 2.21 is said to be one of this kind, having been examined by R. C. Mason, V.S., of Winona, Minn., who reported the case to me as such a decided flexion that he was compelled to turn his finger almost at a right angle to get through the cervix.

Very small os interum. It is a common thing to find barren mares who have been continually bred and repeatedly opened by breeders, stablemen and even veterinary surgeons, without the inner portion of the os being dilated, and at other times a membrane across the os internum which is not ruptured. As a consequence, they fail to conceive as effectually as if the membrane were over the vaginal surface of cervix.

A curtain of membrane, either or both, external or internal to cervix. A very interesting case of this type came under my treatment during the month of July, 1891. The mare was sixteen years old, and had failed to conceive, though stunted repeatedly at different seasons for the past ten years. I had known the mare some six years, she having been served by one of my own stallions during the year 1886, but had given the case no special attention, and at that time knew nothing more than that she was claimed to be very tight by the man who dilated her os. She was given several leaps, but did not conceive, and she was stunted every season following to different stallions, but to no purpose. She was then sent to Dr. Curryer & Sons' stud at Crystal Lake, Minn., with instructions to use the impregnator. The doctor was unable to find the os uteri; it being concealed by folds of mucous membrane. I was called to ex-

amine the case, and found a fold of membrane reflected from the upper vaginal surface of the os. Having passed one finger underneath the fold of membrane with a good deal of difficulty, I succeeded in dilating it sufficiently to get one finger through the cervix. I could then easily feel a second membrane at internal opening of cervix, but my finger not being long enough, or the membrane was so strong, I could not tear it. By taking a small impregnator and dilator, which is about one inch longer than my finger, and passing it through the cervix until the disk of impregnator came in contact with the vaginal surface of cervix, I then made a thrust by pressure on handle of dilator, at the same turning it laterally. I then withdrew the dilator, leaving the impregnator in position. The mare, at once, by straining, threw off at least three pints of viscid, creamy fluid which had no odor. I then had the uterus washed out, which was continued daily until appearance of heat returned some two weeks later. She was then served, using the small impregnator, and has since passed three periods, or about six weeks, having been tried twice a week without any signs of returning heat. I simply wish to call your attention to the facts concerning this case. The mare had been repeatedly opened by parties who would generally be considered competent judges and capable of opening mares to breed. This mare had been so treated by several such men, besides having been examined by a graduate veterinary surgeon, who also used the small-sized impregnator, having succeeded in placing it without the dilator. The external fold of membrane was reported, but the internal one was not noticed, and, not being ruptured, there could be no chance of conception so long as it existed.

Equine syphilis has proven a great hindrance to breeding by rendering pregnancy both uncertain and unsafe, and requires especial consideration, for which I would refer to W. L. Williams' article on "Equine Syphilis" in *American Veterinary Review*, 1888.

2. CAUSES PREVENTING THE PRODUCTION OF A HEALTHY OVUM.—I will notice but one, the atrophy of ovum, from old age and lack of use, as it will be seen by reference that none of these are curable diseases. I wish to note but one case, that of a black mare, record 2.53½, belonging to me, I having bought her in 1887 to experiment on. She had never had a foal, though bred several seasons. After various trials, even by injecting semen through the cervix, she continued to return in heat, and in December I decided to kill her and hold an autopsy. The uterus, vagina, and cervix were

healthy and in every way normal, but on examination of ovaries, they were found to be pale and atrophied, showing no signs of Graafian vesicles or any indication of having produced any ovum for months, possibly for years.

3. CAUSES PREVENTING PASSAGE OF OVUM INTO UTERUS, such as strictures or obliteration of Fallopian tubes, absence of Fallopian tubes, detachments and displacements, simply require mentioning to show how certainly they would prevent conception.

4. CAUSES DESTROYING VITALITY OF SEMEN OR PREVENTING FIXATION OF IMPREGNATED OVUM.—*a.* Endometritis, corporal or cervical, fills the uterine canal with mucus, which either prevents the entrance of semen or destroys its vitality, and has already been considered. *b.* Abnormal growths of any kind which fill the uterine cavity, as for example fibroids, polypi, etc., may prevent attachments of the ovum to the uterus, even if impregnated. *c.* Membraneous dysmenorrhagia, menorrhagia or metrorrhagia and areolar hyperplasia are seldom if ever seen in mares, hence will be given no further consideration.

MALE STERILITY.—Lack of erectile power in the male is not uncommon, and varies with different stallions as well as the same stallion at different seasons or portion of the same. At the beginning of the stud season many stallions fail to perform service with sufficient ardor, although they have been good coverers seasons previous. This may be caused by lack of tone from nonuse, though at other times such a state of things follows certain diseases, such as catarrhal fevers, distemper, and the like, as well attacks as of spinal meningitis. In other cases the blood supply may be interfered with from partial or complete obstruction to one or more of the arteries supplying the penis.

During the spring of 1886 a stallion was brought to my infirmary with apparent paralysis of the penis; the parts hanging pendulous, protruding about six inches. The season previous he had covered about sixty mares, and had gone into winter quarters in good shape, but during the winter suffered from an attack of catarrhal fever, during which time his owner reported him badly swollen about the penis and testes, after which penis remained pendulous. The stallion had already been blistered across the back several times. I applied electricity to the parts, which would at the time produce partial erection and so strengthen them as to enable him to withdraw within the

sheath, but he never regained power of erection or afterward performed stud service.

During the spring of 1889 I was consulted in regard to a stallion, who, the previous season, had served forty mares, and was sold with a warranty of a sure foal getter; but, as he would not cover a mare at the beginning of the stud season, the party purchasing naturally suspected he had been cheated. I recommended as treatment. Fl. ext. nux vomica; Liq. pot. arsenitis; Fl. ext. ergot, and citrate of iron, alternating with phosphate of zinc and sanguinaria. This treatment was continued but a short time, when the animal's vigor returned, and there was no further trouble that season. I also had a case of my own, a four-year old stallion, who had been a good coverer until 1888, when I loaned him to cover some mares in the country, at which time he was kicked in the front leg, and nearly died as a consequence of erysipelas and distemper which followed. The following season I could scarcely get him to cover a mare, and then invariably failed to get them in foal until the foregoing prescription was used, when he succeeded in getting all five mares in foal.

Absence of spermatozoa is not uncommon, especially in colts less than two years old, and as a rule at any age, should the testicles not appear in their natural locality, the scrotum. In cryptorchids, as a rule, when neither of the testicles appears visible, no spermatozoa are to be found.

Old age is a common cause of impotency, but a great deal can be done to tone up these organs and revive the natural functions by judicious use of some of the remedies which prove so beneficial in the lack of erectile powers.

Excessive length of penis is far from being an advantage either to male or female. Such stallions are seldom sure foal getters, and often injure the mare during copulation. I have found in these cases great advantage in using a shoe-boil boot as a washer, thus keeping six or eight inches of penis outside the vagina, and in many cases, it has insured foals where the stallion was considered not only unsafe to the mare but uncertain as a foal getter. On the contrary, stallions with a short penis will cover a greater number of mares, and succeed in larger percentage of foals.

During the summer of 1882 I stinted two mares to Seneca Starr; he was a large horse with excessive length of penis and a very ardent coverer, though apparently not a sure foal getter. Having previously injured several mares and killing one by lacerating the fundus of vagina, I decided to try one by using a shoe-boil pad as a washer.

The move succeeded in getting her in foal at the first service. The other mare was stinted without making use of the pad, and though returned several times, did not get in foal, though she had been a regular breeder before and had a colt by her side. The only mare in foal to Seneca Starr that season was the one on which the pad was used. The next season the pad was made use of in serving mares to him, and as a result he got some twenty mares in foal.

WEAKNESS OF SPERMATOZOA.—There is little doubt that the vitality of spermatozoa differs very materially in different stallions as well as in different kinds of animals. I have at various times examined spermatozoa under the microscope from different stallions after castration, as a rule, having a pail of water in which to place the testicles after removing them. By so doing they were all kept as nearly as possible under the same atmospheric conditions, the only difference being the length of time between subsequent castrations. When ready to make microscopic examination of semen, I would lay the different sets of testicles by themselves outside the water, and put on a glass slide, under a top cover, a specimen from each set, and examine them at different intervals of fifteen minutes to one-half an hour. During the summer of 1877 I made a number of these experiments, and invariably found the spermatozoa from one set of testicles would outlive the others, and as a rule, those stallions whose testicles showed signs of injury, or inflammatory process, also showed less vitality; whereas the size of the testicle seemed to make little difference with the vitality of semen, both being healthy. Small or medium-sized testicles, as a rule, are less subject to injury, especially in stallions that are tracked or given fast road work. In one case particularly, where specimens were examined, the animals having been castrated between eight and nine o'clock in the morning on a moist, warm summer day, the specimens were prepared and examined between nine and half-past nine in the morning. I had occasion to show these to parties as late as five in the afternoon of the same day, and, to my surprise, the specimen from one set of testicles still showed vitality enough to move, while all the others showed no signs whatever of life.

I am of the belief that under favorable circumstances, if properly prepared, the semen of a stallion can be kept for several days; and that, at some future date, we will be able to send specimens of semen to be injected, instead of mares to be served. This would not only save the expense and time of shipping the mare, but a single service

of a valuable stallion could be used to impregnate a number of mares, by which means a stallion could as easily get two hundred colts each season as fifty by ordinary methods.

THE DIFFERENT INSTRUMENTS AND REMEDIES NOW ADVERTISED FOR BARRENNESS IN MARES.

I present for your consideration these instruments and principles, indicating ideas of greater or less value; but all point toward one great principle—the dilatation of the cervix and its retention in that position and centre of canal. To say that any one or all of the instruments can prove successful in every case is an impossibility, though I am sorry that such advertisements as the following are to be found in our stock papers regarding one of them at least—"Barren mares made to breed regularly. All mares made to conceive at first service." This makes it practically non-professional, and is a poor recommendation for parties who indorse such statements. It may serve a special purpose in certain cases, but it is far from being infallible, and its claim is not only unjust and misleading to breeders, but unreasonable and erroneous. The Eureka requires from six to ten hours for expansion, hence the mare must either wait or return for service the next day. It is the most expensive one of the kind in the market, as each service requires a new instrument.

The funnel-shaped instrument is practically out of use on account of the great difficulty attached in placing it. The exceeding wide spreading end that is intended to pass through the cervix has to be folded or rolled very tightly in order to get it even in a fairly loose os; and in cases that are at all constricted, less than to admit two fingers, it serves little or no purpose. Even should it be crowded into the cervix, it cannot expand, and is either thrown out by the mare, or works out during the act of copulation.

The Meddick pattern consists of a flat disk and a soft rubber tube; the latter surrounded by convolutions or flanges of rubber to retain it in position, and is held in shape by a hard rubber tube small enough to pass through the others. This is too complicated to be practical, even if the convolutions were not a source of annoyance in removing it from the cervix, and in retaining filth unless *every precaution* in cleansing and disinfecting is followed after each service. Besides, this is a hard rubber tube, when the least projection would subject the glans penis to more or less pain (if not injury) in proportion to the closeness of the cover and the ardor and impetuosity of the stallion.

As to medical remedies, those kindly sent by Mr. Wallace Barnes for your inspection cannot be given a professional standing, on account of the misnomers under which they are to be recognized; not being represented either in allopathic or homœopathic medicines; consequently are shrouded in mystery, which injures their reputation, at least from the professional standpoint.

As to my own patterns of impregnators and dilators, three represent those which have been in general use for several years. The impregnators consist of a hollow tube or cone composed of soft rubber of sufficient thickness and firmness to retain its shape and resist the pressure of the cervix. Somewhat constricted at the disk portion, that it may be self-retaining, the disk on the posterior surface is made so as to correspond to the urethral sinus of the glans, while the opening through the disk is sufficiently large to admit the projecting end of urethral tube. The greatest difficulty is to make the two sizes meet all of the requirements and variations of the cervix, as well as the peculiarities of the stallion and the idiosyncrasies of the owner or attendant. In certain cases No. 1 (small size) proves difficult to insert on account of the close tense os, but with the dilator this is quite easily obviated. In other cases No. 2 (large size) may be too small to be retained, and requires quite a large size.

Some stallions are especially sensitive while covering a mare—generally those stallions whose parts are larger than normal or those having a big season, and are not very anxious when they find the least interference. To obviate these difficulties I have to present you four new models of impregnators and dilators. They consist of the same size tube internally, so that a single dilator fits the entire set, while the external dimensions correspond to the size of the cervix, anywhere from an inch to two and one-fourth inches in diameter and from three and one-half to four and one-half inches in length. The disk consists of a hollow air space as well as the bulb. The disk closely corresponds to the os in pliability, and the most sensitive stallions should fail to perceive the difference, and as a consequence make an equally close cover as when no instrument is used. The advantages in favor of the tubular variety of impregnators are the close approximation to the normal condition of the cervix during heat, rendering complete—as it does—the communication between vagina and uterus, thus assuring easy access for the seminal fluid, besides being easily inserted and ready for immediate use. They are *cheap*, as one *will last for years*, and can be used on any number of cases.

DISCUSSION.

Dr. FAUST: Before I came to this place I saw that there was a paper to read on the subject of "Barren Mares," and naturally I looked up the subject of "Barren Mares." I found that a man named Friedler was asked by the German authorities why he was so successful and so much more successful than the rest of the breeders, and he claimed that his success was by reason of the appropriateness of the time when copulation took place. He says that he never had the mare covered—that is, the particular mare I am speaking of—excepting on the third day after the heat began, and then on the seventh, from the seventh day, if the mare has not conceived, to the twenty-first; and never to return again until the next period. He separates his mare from his horse, and recommends very highly not to give too laborious work as to speed or labor, and not to feed too high, or as low down as starvation, but to keep the animal in good sanitary condition, and by no means does he allow his mares to come in contact with a stallion during the time I speak of. To show the correctness of his idea, he speaks of seven mares that had a very bad reputation as foal givers. He took twelve mares that had likewise a bad reputation of bearing, one of them over thirty years old, and he reports, as a test of his theory, that he had eleven foals out of the twelve mares, and he, as I said before, claims that the time or period is worth more than any other theory that has been advanced—of course, diseased condition excluded.

The PRESIDENT: I should like to have seen this brought out a little more clearly in Dr. Lyford's paper. I am very sorry he did not give us more statistics as to the results of using the impregnator as a mechanical means of overcoming the troubles of sterility due to mechanical causes. He made a quotation from Dr. T. G. Thomas that applies to the mare quite as thoroughly as to the woman, and that was that the trouble was first in the neck of the uterus, and, secondly, due to the endometritis. That is, the discharge of endometritis, in place of being alkaline, is acid. Spermatozoa cannot penetrate where there is a discharge of acid fluid. It must be alkaline fluid. I think in a majority of cases that that is the trouble. Again, there is no question but what mechanical means for the dilatation of the neck of the uterus will sometimes relieve the inflammation, causing a very slight attack of endometritis and act as a curative agent, just as the passage of a sound into the urethra where there is stricture will do in cases of gonorrhœa. Take gleet, and a sound changes the discharge from that of a chronic inflammation to that of an acute one, which frequently subsides at once. I would ask Dr. Lyford if he can give us the statistics as to the use of these dilators?

As it is advertised as a common article and put forth to the public, it is very misleading. I had a case of a very valuable mare that had been under treatment for a year with dilatations; my first examination and syphoning brought out five gallons of fluid. He spoke of using the pumping syringe. In place of a syringe, which I rarely use now in those cases, I have an India-rubber tube four feet long, in the end of which I have a lead nozzle over which rubber of the same diameter is stretched. With this I can throw in the quantity of water I wish and get the pressure I want. Where there is a large discharge I allow it to go twelve inches into the uterus and pour the water in. In this way I have a syphon which will clean the womb out entirely and throw in the amount of fluid that the walls can stand. I think it a safer instrument than the syringe that he spoke of. I think Dr. Lyford should indicate what percentage of sterility he thinks is due to mechanical causes.

Dr. KNOWLES: I have devoted some attention to sterility for the last four or five years, and I believe that a small percentage is due to a constricted os. The most frequent cases of sterility I believe to be following chronic cervical hyperæmia. In regard to the syringe, I will say to Dr. Huidekoper that I have a sort of "universal family syringe" that I use for mares, in the shape of a ten-gallon keg. Attached to that I have a long piece of soft rubber hose. I can elevate this keg to any distance I desire by a pulley and rope, and give such force to the water as I desire, and as little force as I desire. I simply use the rubber tube without any metal appliance at the end of it. The acute cervical hyperæmia I have found to be best treated by injections of cold water at a temperature of 65° F., with from 10 to 20 per cent. of boric acid. Chronic cervical hyperæmia is not always amenable to treatment, but in a majority of cases it is.

This is a subject, though too long for me to talk about here, and as I have quite considerable data and notes on cases treated, I will try at some future date to give you a paper on sterility according to what I know about it.

The SECRETARY: I was exceedingly interested in the paper of Dr. Lyford on the question of sterility, and assure him that he has enlightened me on many causes that operate in that one disease that is such a great loss to the breeders of the country. At the same time he has brought in here for us to examine and consider a number of articles which are certainly decidedly out of place. As a body of veterinarians we can give no cognizance to patent articles by the laws under which we operate. That is equally true of proprietary articles, and the remedies here exhibited for us to consider and discuss are certainly out of place. This Association cannot be in any way used for the advertising of specific plans of treatment, or of patent instruments, or of proprietary articles.

Dr. LYFORD: I do not think there is one of those things patented. At least not to my knowledge. In the second place, Mr. Barnes, of Connecticut, took the pains to send me some homœopathic medicines, which, if you all know about, as I do, you will not hurt yourself with. I brought them here, thinking somebody had experimented with them, and if they obtained results, I should like to know what they were. I have never tried them. I brought them here because he was kind enough to send them for me to look into if I wished to use them. I know nothing about what they are, and know nothing further than their labels indicate. I have a number of testimonials from those to whom I have sent my articles, wherein they claim that the articles have given good results. So far as recommending them to you, I do not think I have flattered myself or the instruments very much in my paper. The question of simply bringing them before the public is merely to show the principle. If they are wrong in principle I would like some one to get up and say where and how. Or they can take them out in the dark and feel them. (Laughter.)

The SECRETARY: I referred to a portion of the paper where Dr. Lyford, in speaking of the impregnation, states that it is possible for it to take place without the rupture of the hymen. Does he mean complete or partial?

There were three cases reported of large calculi, or stone, found within the uterus, and one was in an animal that had been served by a horse unsuccessfully. In the other two there was a complete hymen, and the conclusion was that it could not have been put in from the exterior, if such was the case. The stones were not exhibited, but were ordered to be sent to Philadelphia for examination. They were described as weighing somewhere from twelve ounces up to two pounds. There is nothing in the books about it, and I simply ask as to the rupture of the hymen, whether it was complete or partial.

Dr. LYFORD: I have examined a good many mares, and, as a rule, make an examination before the stallion is allowed to cover them. In a great many cases they claimed to have bred the mare prior to this time, and that the hymen was still intact, and in some cases probably not complete. In a great many of these cases, as you pass your hand in and bring it back, you can feel the membrane very plainly.

Sometimes you can draw it outside. I have done this, and shown it to parties and students who were standing by. I have known a stallion to cover a mare and the upper part of the hymen to remain intact, and the copulation seemed to be complete and all right. As far as a case that had been in foal with the hymen intact, I do not know of such a case.

Dr. WILLIAMS: I would like to make a few remarks. I have been engaged in practice largely in horse-breeding districts, and mostly with heavy draught animals. In my experience sterility has been due usu-

ally to first, excessive fatness, and second, to a plastic condition of the uterus with widely dilating os.

Dr. BRYDEN: I have listened with interest to this matter of the peculiar characteristics of breeding mares. I think we mistake very much when we commence so far up as going to the matter of copulation. The influences of domestication have much to do in forcing changes in the genital organs and in other parts of the system, and my impression is that instead of devoting too much time, which, of course, is laudable, in trying to correct these defects, it would be better to improve our system of managing horses under restraint. Of course, where animals are now kept in a stable for six months of a year they do not attain to that robust and symmetrical organization that would be attained if they were running around with greater freedom of action. An important fact is to think of the actual condition of things. Animals with defects of this kind are always animals that are not fit to breed from. Much is to be accounted for by the animal's condition.

Dr. LYFORD: Dr. Williams has brought out a point that I had overlooked in my paper, although I had it down as a point. One point he made was that this band attaches to the os and diverges in different directions. I want to call on Professor Baker for an explanation, so that we may hear both sides of the question.

Dr. BAKER: In reference to the use of the impregnator, I have no experience, but from my observation I have opportunities of knowing that in many cases it has proved successful and very satisfactory, and I wish to say in regard to an expression of opinion dropped a few minutes ago by the Secretary, that this Association should denounce the patenting of instruments, that in my opinion it is a little too finely drawn, and this Association as veterinarians can hardly afford to be too strait-laced in regard to such things. Our interests and the interests of the agriculturists are closely allied, and anything that is of practical use, whether patented or not, if it is, as I say, of practical use in the advancement of stock raising, we should recognize it and not refuse to give support to an impregnator, for instance, simply because it is patented. It seems to me it matters not whether it is patented or not, if it is useful it should be indorsed. While, of course, this cannot give a positive cure to barrenness in every case, yet we do know that in many cases it has proved very beneficial.

Now, in regard to the idea that domestication is responsible for barrenness in some cases. It is possible that in some cases it may be, but we find barrenness in many cases where the animal has not been in anything but a natural state. Therefore, in such case, the domestication, of course, could have nothing to do with the barrenness of the mare. In many cases I am confident that the impregnator may be made very useful.

Dr. MILLER: I had in mind to reply to our Secretary some moments ago, but I thought perhaps in doing so I might be called to order by the President or some member of the Association as being a little out of order, my remarks being foreign to the subject. I could not very well speak as to the impregnator, because it is the first time I ever saw one. I think, as Dr. Baker does, that our Secretary draws the lines a little too fine. I can see no comparison between the impregnators upon my left and patent medicines in my front; I do not see why any member of this Association should be taken to task, even if he recommended an article of that kind, or of any other kind, provided it was beneficial to us in our practical purposes and beneficial to us in our profession. I believe that we are as a class of people doing what we consider best for the elevation and standard of veterinary science, and I believe we are not doing anything to lower it when we recommend anything that we know is practical or otherwise of benefit to us as veterinary scientists. It seems from the statements made here that these instruments have been of great benefit. The fact of these things being advertised in the journal at Chicago, or advertised by the proceedings of the Society, seems to me to be a benefit to veterinary science rather than the opposite. We are to-day the only people in existence that I know of who do not advertise their business. If any veterinary college, or this Association, puts an advertisement of the business in a newspaper, excepting the simple fact that the doctor is a veterinary surgeon, and will be found at a certain house, he would be brought before us for court-martial. I say this is drawing the line too fine, and is injurious to our profession. I believe at the same time that it would be well for us to make no invidious comparison between the patents. I take it that upon the whole we should not confine ourselves so considerably to the letter of the law in respect to these matters as they touch the code of ethics.

The SECRETARY: It has been an established rule in this Association, by usage, and in the Constitution and By-laws and Code of Ethics of this Association from its formation, in 1863, that we take no cognizance of any patented article or any article in which a member of this Association, or member of this profession, sought a patent for. Any instrument or implement of use that any member of this Association had any knowledge of, or any plan of treatment, specific in character, or of extreme value to the profession, that he may have discovered, it is his duty to impart it to us, and it is our right to demand it. From the usages and laws of this Association and from its earliest growth this has been a cardinal principle with us. We are banded together as a body of men. For what? Not for our individual advancement, nor our individual success, but for the welfare of our country. According to your Rules and By-laws, the article is patented. We must, by virtue of the respect we have for those laws, denounce the use of it. Therefore, it

ill-becomes a member of this Association to seek a patent on an article by which he will have sole control of that article. Again, we are amenable to him for its use as well as the man who puts up the proprietary remedy and refuses to divulge its formula and puts it upon the market. The usage of this Association is such that no man is allowed to advertise anything but his name and address, and if he is competent in his profession and is fitted for the duty he has assumed, and exposes himself to the public, there is no town, there is no city, there is no borough in these United States where he will not receive a just measure of reward for the ability that he possesses, and receive in return a fitting compensation for all that he does toward benefiting humanity and all the brutes of creation.

Dr. MILLER: No one appreciates what the Secretary has said better than I do; but when it comes to the poor fellow he speaks of who is cast out in the borough and puts his sign on the window and sits for patients, I know there will a long time elapse between drinks, and it will be a long way between meals. It will be some time before the people will come to him. He has gradually got to drift into practice and wait for people to come to him. We are the only profession disqualified from advertising, and while I agree that it is right and proper that it should be so, and while, if we are deserving of patronage, the people will gradually come to us, at the same time I do say that we are drawing the line a little too fine when, as I have heard it expressed here, a man should not even put a thing on his letter-head but his own name. I do not believe in advertising at all, but at the same time I do not believe that because a man puts on his letter-head that he belongs to a State society, or to this society, that he is amenable to the strict laws of the Association. I am not in favor of promiscuous advertising, and do not wish to be so understood.

THE TRANSATLANTIC CATTLE TRADE AND ITS REGULATIONS FROM A VETERINARY POINT OF VIEW.

By WILLIAMSON BRYDEN, V.S.

WITHIN the last year the American Export Cattle Trade has been before the public more conspicuously than at any time since its commencement, some fifteen years ago.

This has arisen principally from recent legislative and other interference at home and abroad with a subject imperfectly understood, not fully developed, and that has been grossly misrepresented. It is consequently regarded by those engaged in important branches of the business as in many ways unfair to them, and an injustice which cannot possibly benefit the animals or improve materially their freedom from hardships in transportation. It is a blow, especially, at the ships, no matter what their class is or what ports they sail from, up a river 130 miles, or within an hour of the open sea.

This traffic, as is well known, suddenly assumed large proportions. At first both lean and fat cattle were shipped, until fear of contagious diseases stopped this and permitted only fat animals, fit for slaughter, in quarantine, on landing, and dressed beef.

At first, as with all new undertakings, a period of immaturity had to be passed. Ships built for other kinds of cargo had to be converted into cattle boats, which was in most cases easily done. These were of different classes and tonnage. The crews may have been at first unused to ships with such cargoes, and ventilation on some not as perfect as now. The cattlemen were unused to the sea, many of them entirely unfit and often ill paid, so losses occasionally resulted that could possibly have been avoided.

During the same period our inland transportation systems were also imperfect and unprepared for the increased business, the stock-yards and resting-places poor and inadequate, the cars plain and primitive, many of them old, often overloaded and without sufficiently

experienced attendants. The animals were consequently neglected. Some died on the journey before reaching the yards, from which the survivors had often to be hurried to the ship without proper rest ; bruised, tired, hungry and thirsty, it is no wonder that some died at sea, and directed everyone's attention to the ships, unjustly blaming them as the cause of all these losses.

In spite of all this the business continued to grow, losses not being generally excessive, and insurance rates declined as those engaged in handling the cattle gained experience.

The British stock-raisers could not supply their commercial, manufacturing, and working populations with sufficient home-raised beef and mutton products, which they must have, at the lowest prices, and which this and other countries had enough of and to spare ; so the business increased and flourished, untrammelled by regulations or restrictions. Its rapid increase, however, made it necessary for the Privy Council of Great Britain to take some action in the matter, to satisfy conflicting political, commercial, and agricultural interests. For example : Land-owners, to whom the farms belonged, and the tenants who leased them for long periods at high rents, became alarmed at the great and sudden invasion, fearing that it might prove to their disadvantage and perhaps their ruin, even if the experiment was finally successful. Some politicians used the subjects for party ends. Others believed in protection, or in fair play between nations ; while others again believed that the British Colonies ought to get all the benefit of supplying her wants. The friends of Ireland, too, saw in such an influx, especially of lean cattle, a menace to their regular business in supplying English and Scotch farmers, who raise large crops of roots, fodder, etc., with young, lean animals for fattening. Consequently all such influences had to be considered, all such interests had to be dealt with.

When to these were added the fear of contagious diseases, from which the agriculturists and stock-raisers of Great Britain have suffered so much within the last forty or fifty years, the objections and fears of the farmers, especially, were to be expected.

The discovery soon after this trade opened that contagious pleuropneumonia was widespread in some districts of the Eastern States, and its subsequent appearance in the West ; the extravagant reports of the prevalence of tuberculosis made by United States and State officials ; the alarming and sensational methods adopted by them to eradicate it, as witnessed in Maine and other parts of the Eastern States, where, instead of individuals being condemned, not only

whole herds were slaughtered, but animals sold long before, if some relationship could be traced, were hunted up all over the country and dealt with in the same summary manner. The fact of dealing with such a disease more harshly than they would with contagious pleuro-pneumonia surprised every careful student of the subject, and led many to think that our cattle population was in a deplorable condition. At all events, it forced many people abroad to suspect that what was being called tuberculosis was really a dangerous extension of contagious pleuro-pneumonia, and yet this did not exhaust the list of obstacles, for still other diseases, such as splenic fever, anthrax, actinomycosis, etc., annually, during what ought to have been the best months of the year for shipping cattle, demanded their sacrifices.

When all this is considered, the moderately conservative course pursued by the Privy Council of Great Britain would surely seem deserving of applause, although at the same time it makes one wonder what their course will be when the United States is declared free from contagious diseases, which the Bureau of Animal Industry assures us it will be soon able to do, and which we all hope will be the case.

The opportunity is certainly a grand one for them to show practical statesmanship of a high order, and which will remedy, in part, at least, the unfortunate state of things which took the meat-supply out of the hands of the native farmers and stock-raisers, where it *naturally* belongs, as occurred when fat cattle and dressed beef only dared be admitted. Surely there can be no great danger in admitting healthy, young "stores," as young animals for fattening are called, the farmers would again be "in" the business, and so would British railroads and smaller ships.

Suppose a country well stocked with two-year-olds, born and bred in a natural way on the prairies and plains, from improved herds, suckled by their mothers—not on skimmed milk or slops—should not such animals increase greatly in size, and ought to pay well for feeding. They are raised under circumstances that make them not only hardy but that fit them for any kind of a journey. The danger from such to the farm stock of a country must be trifling indeed. Another important thing to be considered is the liability to sudden interference with supplies from long distances in the event of war; fat cattle and beef would be exhausted in a week, whereas a country full of young "stores" would last a year—besides improving and fertilizing the farms, so that thus crops would double.

It must be the veterinarian's, as it is the scientific solution of the whole business if politics and questionable measures do not interfere. It also offers a solution to the humane side of the question, if carried on under proper restrictions and regulations, applied not to the ships alone but to the whole journey, whether on land or sea. For if old ships are condemned, why not old cars, cattle-yards, etc.?—applied not to mean, unscrupulous ship-owners, but to a reckless, unscrupulous class of shippers and foolish legislators, who have caused by far the most trouble.

The great fault with "good" friends like Mr. Plimsoll—earnest, well-meaning people, no doubt—is that their methods of investigating the subject have given them false impressions of the share of blame the ships are liable for. Of course, there are good ships and poor ones, good ship-owners and mean ones. He has done the regular lines great wrong and injustice. For the fact is that reckless shippers have been largely to blame for the hardships the animals have suffered, being subject to no regulations in handling their cattle, for none worthy of the name have ever been carried out on the inland half of the journey, and more than half of the help sent to sea with their cattle has been ill paid and worthless.

The movement of large bodies of cattle has always been attended with some degree of hardship from the times when they had to be driven from market to market to the present, and half of the lives of most of such animals is made up of hardship; this must not be lost sight of. Those sheltered and cared for—in warm places—while being fattened cannot endure the fatigue and exposure that animals can that have grown hardy and strong on their native plains under scorching heat and droughts of summer and the storms of winter. The *class* of animals that ought to be allowed to be shipped is, therefore, the most important consideration in determining what regulations are necessary, the alterations required for the ships being entirely a secondary matter, and something that can easily be settled afterward.

Soon after the commencement of this traffic and up to a year ago great improvements were made in the cattle-cars, which led everyone to believe that the animals would be greatly benefited; whether this was due to the energy of the patentees and the companies controlling them, the enterprise of the railroads, the demands of the shippers, or all combined, I cannot say; at any rate, "Hope told a flattering tale," for a greater average of comfort to the poor beasts was at least made possible, and if proper regulations should be en-

forced upon unscrupulous shippers and slack practices, much benefit would follow. But as the greater efficiency of these cars, with their conveniences for feeding and watering, improvements in brakes and couplings and other attachments, and contrivances which doubled the rate of speed at which such trains were formerly run, became demonstrated, the example of the willing horse that just gets more to do, repeated itself. For instead of the proper complement of animals being carried, and resting-places stopped at, it is now no unusual thing to find two or three extra ones crowded into the car-load and hurried through without any attention. Thus, the animals do not receive the benefit of such improvements, as all the abuses incident to the old cars have been repeated. Of course, there are shippers who handle only the finest cattle and take proper care of them as well as of any class of animals shipped by them. They are not all reckless. The promised improvements in the stock-yards and resting-places at our ports have not been carried out; they ought to belong to the Government, but must not be located as was blunderingly done in the case of the Boston cattle quarantine, which is a disgrace to the Department. Many of the yards remain the same as at the commencement; one port at least, Portland, has none. At different times during the spring months, when the frost is leaving the ground and the weather is rainy, it is no unusual thing to find the cattle standing up to their knees—yes, to their bellies—in mud, the poor creatures being unable to drag themselves through it to lie down, or to reach water and feed, the yards being often in this condition for two or three weeks at a time. Then, again, in summer they are exposed to the burning sun without shelter, their tongues hanging from their mouths, and they panting as though the breath would leave their bodies. To animals that have been fattening in idleness under cover for months, this is a very poor preparation either for the rest of the journey or the rest such a journey demands, without even counting their sufferings in open-sided cars in the storms of winter.

Nothing could better illustrate the point, that it is useless to put high-standard restrictions on the ships before the inland systems are on a level with them, than the fact that some of the finest ships ever constructed for the business have within the last six months lost as many cattle as were lost on the smaller ones, which they replaced, during the same length of time. I allude to the Leyland Line. This was from no fault of the new ships. The shippers sent a class of animals unfit for shipment, when forced to undergo hardships

from reckless treatment and abuse before reaching the dock, a fact which the United States officials are perfectly cognizant of, and still overlook.

Mr. Leyland, who owns one of the finest lines that every crossed the Atlantic, said at the recent investigation in London: "It is not a question of stopping the trade, but of regulating it," or words to that effect, and it is the key to the whole subject, to look out for reckless ship-owners and shippers and slack practices everywhere.

As is well understood, this matter must be regulated, but the ships must not be made the only sufferers. Neither, for that matter, must the inland systems or any other. There is no need for any regulations that will either destroy or embarrass the trade, or that cannot be easily arranged or enforced. Every branch of the business must be in harmony with the other, and the great nations engaged in it must be just to each other, and see to it that all regulations and restrictions are framed and impartially carried out, not through the tricks and bounce and bluff that scheming traders resort to, but as would be expected from two great honorable nations. No order, even from the highest sources, must be allowed to pass diseased animals when justly and wisely condemned, as was recently done in Boston with scale sheep.

In some respects the recent investigation in London may result in good in the future, in others it has already done great harm, and in one instance its effect has been even *unpatriotic*, as when the United States is encouraged to deal with British ships in the harsh, arbitrary way they are doing. For proof of this, I will take the liberty to quote from a letter to me from the Department at Washington, when appealing to them for a delay of the 2 feet 8 inches clause, in the cases of Lancastrian and Philadelphian, which says of the regulations that they "meet the objections raised by English authorities, and will most probably prevent their issuing such stringent measures as might have driven all vessels out of the transatlantic cattle trade." What nonsense! A party that would encourage such a thing would not last a year in Great Britain.

These regulations have consequently been carried to such a high standard that ships built expressly for this trade by the highest authorities in marine architecture do not reach it. Not only this, but the enforcement of the restrictions imposed are being carried out so long before the regulations affecting the inland systems of transportation, etc., can be carried out, that it is a piece of patchwork and not creditable to the fairness that ought to govern such transactions be-

tween nations. The improvement of the stock-yards, by building shelters and drainage; the class of animals fit for shipment, their size and weight, the number allowed in a car, etc., these things must have been wilfully lost sight of altogether. The number that die on the inland journey to port is not known, and post-mortems are seldom or never made; disinfection is hardly thought of *excepting on the ships*, all this part being a "go-as-you-please."

This solicitude for the condition of British ships is unbounded, even to the extent of inconsistency. Heavier fittings are demanded, although their fastening to the deck is the same; stanchions are substituted by heavier ones, although they could have been strengthened with wood, which has always proved sufficient and only makes extra expense; spaces are widened, instead of regulating the size and weight of the cattle—if 2 feet 6 inches is enough on the spar deck it must be enough on the main deck; valuable space is sacrificed for alley-ways; instead of employing an extra man or two, not "stiffs," but men paid for this work, which only keeps them busy about ten days in a month, the other twenty days of their engagement being spent in idleness. All this power is in the hands of the Department, yet they have not used it. The bill conferring this power passed without Boston's members of Congress knowing that their port, the finest in the world, was being classed with Philadelphia, 130 miles up a river; their steamship agents, too, simply bowed their heads and accepted the situation—poor creatures!

No finer opportunity was ever offered the veterinarians of any department to distinguish themselves by a splendid philosophic interpretation of this vast subject, no worse failure to grasp the situation with professional comprehensiveness and justice could well be presented. The assumption of the role of shipwrights and marine architects by them and the neglect of proper professional work is a subject they must expect to be criticised for. Were the case reversed, and United States ships subjected to such treatment by a foreign country under similar circumstances, I am very sure it would not escape Mr. Blaine's attention, or be allowed without a vigorous protest and demand for impartial treatment; every concession demanded from his ships having to be met by equal improvements on the first stages of the journey. Well might another committee be appointed to investigate this end of the business.

DISCUSSION.

Dr. MICHENER: I wish to say a few words in reply to what the gentleman has said in regard to the regulations that should govern the shipment of cattle abroad. I did not read all of the paper or hear its full reading, but it strikes me that the burden of his song was that while certain restrictions were placed upon steamship companies, that similar healthful restrictions were not placed upon the railroad cattle handlers, and should be so placed as soon as possible. I have no reason to question the fact referred to by Dr. Bryden, but take it that the irregularities complained of are only around Boston. We have no such condition in the stock-yards of New York and Baltimore, Philadelphia and Newport News. We have nothing in these yards which appears to be anything like as bad as he details as existing in Boston. I have seen most of these yards I speak of, and instead of the cattle wading in manure up to their knees or bellies, I found the yards to be well paved, to be covered, and cattle protected from the sun. They have plenty of room, too. Another point he makes is, that cattle do not have sufficient rest. I would say that export cattle have, as a rule, twenty-four hours' rest at the point of shipment; at least they should have that. If the parties conformed to the rules and regulations of the Department of Agriculture, Bureau of Animal Industry, they would have that rest. That rule is waived in some instances, when they come in a few hours behind time, and where the steamer must sail by a certain hour. Then they go a little short of twenty-four hours' rest; but whether they go much short of that I do not know.

In regard to regulations of shipment, as applied to steamship companies, I will say that these rules were only issued after a friendly conference between Secretary Rusk and the agents of the transportation lines. The regulations were the result of this conference. There was no objection to any regulation by the steamship people at that time and I do not see any reason for objecting to any regulation. They seem to me to be eminently fair and proper. Whether those regulations were issued as a humanitarian policy, or a policy of gain, I do not think it is worth while to go into. These regulations were hurried by the agitation on the other side. We all know of the exaggerated statements made abroad of the cruelty in the shipment of cattle brought over. Upon investigation those charges were found to be unfounded. The export cattle trade to-day is as well conducted, so far as shipments are concerned, as any other trade, and cattle are going over at a less loss at this time than ever before.

Complaint is also made by Dr. Bryden as to shipments across the

country, that we do not disinfect the cars fully. I understood him to make that assertion. In reply, I will say that we do disinfect all cars.

During the summer, when we were having danger from the Texas or Southern fever, I am glad to say that among export cattle the loss was thirty-three and a third less than heretofore. I hope that in a year or so, by watching all the railroads and stock-yards, we will have nearly wiped it out.

There are very marked improvements that may be made in the transportation of cattle from the interior to the seaboard, and the Department is struggling all it can to bring forward that condition of affairs which we all wish for.

The gentleman spoke of palace stock-cars, as they are called. I think that you can understand that the Department of Agriculture cannot champion any one of these cattle car companies and push it on the market, but we are insisting as nearly as we can upon the frequent unloading of cattle. I will state to the Doctor that if he knows of any instance where the cattle are not unloaded and rested and watered at the proper points within the proper hours, he should call the attention of the authorities to it. There is a statute that compels the railroad companies to unload cattle every twelve hours, or something like that. I do not remember the letter of the law exactly, but it is safe to say that the law provides that they shall be unloaded once in every twenty-four hours, and fed, watered, and rested. And anybody who says the railroad people are violating the statute has nothing in the world to do but to bring it to the notice of the United States District Attorney, whose business it is to prosecute the railroad company for such violation. The fine, upon conviction, is five hundred dollars, and half of the fine goes to the informer. So that if the Doctor knows of these violations he will have no trouble in making some money.

I do not know that I have anything more to say about this matter than I have stated, except to add that cattle are certainly shipped very thoroughly nowadays. I have seen cattle come into New York by the hundreds of carloads, and I have never seen them come in suffering. The restrictions on the railroads will be more severe in the future, and I have no doubt everything will be done that is practical to do in this great traffic.

Dr. MILLER: With reference to the shipment of cattle, I wish to say a word or two in reply to some statements that were made by the gentleman who read the paper on the transportation of cattle. As has already been said by Professor Michener, if they have in Boston illy ventilated and badly disinfected cars, that condition certainly does not apply to other parts of the United States. I speak for the port of Philadelphia, positively; and I can say as much for the port of New York, because I have been there very often; and can speak of Baltimore as well. In

reference to our yards in Philadelphia, I can say that they are paved and drained and covered. Cattle, upon their arrival there, are put in those sheds, and we have a particular part of the yard set aside especially for export cattle. They are cared for just the same as they were prior to the time they left the barns from which they came. There are independent troughs in each stall, and separate feeding-troughs, as well as watering-troughs. We know about the time they are to arrive, and there is hay put in the boxes, so that they are not disturbed after their arrival by the putting in of feed. Hay is not given to them in such quantities as to allow them to overfeed themselves. They are then watered and after a while given a little more feed. The cattle are in very good condition when they arrive there. The cars in which they are shipped are the best the railroad can get at the present time. I have a statement made by Martin, Fuller & Co., to me. They are the largest shippers of stock. They told me that during the last year their percentage of loss between Chicago, the principal shipping point, and Philadelphia, had been less than 1 per cent. Since I have been at that point examining export cattle, I have had but two animals to die upon the road between Chicago and Philadelphia. One of those died from getting down in the car and being overheated, and the other had to be killed at Pittsburg on account of having his leg broken between Chicago and Pittsburg. There has not been the loss of a single animal that left Chicago, between that point and Philadelphia, except these two cases I state. That shows you that they must be carefully started from Chicago and in good condition when they come. There is not a car arriving there that is not thoroughly disinfected before it leaves. The cars are cleansed and disinfected before I allow them to leave port.

Dr. Bryden also stated that there were too many cattle crowded in the cars. I do not know what they do in Boston, but in Philadelphia we do not do that. The cattle are loaded so that they can stand comfortably and have sufficient room at the same time. The cars are loaded with from fifteen to twenty-one head, and if the cattle are very large, only sixteen are allowed to be put in a car. They are all unloaded in Pittsburg, fed and watered and reloaded in the same cars before being shipped from there, and in the same cars in which they leave Chicago they arrive in Philadelphia. After unloading in Philadelphia, the cattle are detained twenty-four hours, and in very few instances, as a rule, have they been shipped in the steamer before the expiration of the twenty-four hours' rest. Where they have been shipped prior to the twenty-four hours' rest it has been only by the consent of the Secretary. For instance, a train has been delayed, and they did not want to detain the steamer. In one case I remember that the cattle were delayed all night, and reached Philadelphia too late to rest the allotted time of twenty-four hours, but we allowed them to be loaded on the boat.

Otherwise the boat would have been detained twenty-four hours longer than the time set for sailing, and that would have been a great expense to the shippers. I will also add that the cattle are loaded into the boat under my personal supervision.

The Doctor also stated that the space allowed the cattle is not sufficient. The two feet six inches on the spar deck will not do. I take exception to that, and you will see the soundness of my exception. To everybody who has had anything to do with the shipping of cattle it is plain that if you put a certain number of cattle in a car, leaving just enough room for them to stand comfortably together, they will ride more easily than if they were allowed too much space. If too much space is allowed they will oscillate and bruise each other with the motion of the boat or car. In those boats they are loaded in stalls, and four cattle are put in each stall, allowing below deck two feet eight inches, and on the upper deck only two feet six inches. But the regulations will require the new boats to allow two feet six, and we are confined to the old regulations in the old boats, because to make a change now would entail the entire refitting of the old boats, which would be a great expense to the shipper. On account of the rocking in the boat it is necessary that the cattle stand on the upper deck a little closer than they do below deck. There is also below deck another and different situation from the upper deck. There are other influences working, such as the cattle below not having the ventilation that those above have, and they need a little more circulation than the cattle do upon the spar deck. If I had the regulation of the matter I would give more room below and give a space of two feet eight inches above. It has been the wish to put the small cattle in as great numbers as possible on the upper deck, and I have to confine myself to that regulation as much as I can. Those cars coming with twenty and twenty-one head I load on the spar deck because they do not take quite so much room as the larger cattle do. So far as the port of Philadelphia is concerned, I believe that the regulations required by the Agricultural Department are thoroughly carried out. I follow them as far as it is in my power to do, and certainly there has been no cruelty to animals at that place, and I have been careful not to allow any hanging of the cattle in that port. Nearly all the men that go from Philadelphia with the cattle are men who have been going from Philadelphia to London, Glasgow, and Liverpool, and back, ever since we have been exporting cattle from here to there. Of course, they take a certain number of stiffs, but they go with the regular men who are thoroughly experienced cattlemen, and are under supervision. The cattle, as a rule, arrive in London in good condition and with but few lost. When the losses occur they are from storms at sea, where they have been washed from the upper deck.

Dr. FAVILLE: I only wish to say a word or two in this matter. I

can simply corroborate what Dr. Miller said with reference to the port of Philadelphia, and say the same thing in reference to our port at Baltimore. In Baltimore our yards are clean throughout, and each yard thoroughly drained and all water is carried off. The yards in Baltimore are dryer and cleaner, I dare say, than nine-tenths of the farm-yards throughout the United States. Furthermore, in Baltimore they are building an addition to the yards at an expense of \$400,000. \$400,000 will buy considerable lumber, and will give a good-sized yard. As far as the shipping of cattle in cars is concerned, not one car out of fifty that comes to Baltimore but is one or the other of the so-called animal palace cars.

Our cattle there are loaded not heavier than fifteen to sixteen, and sometimes seventeen cattle to a car. Out of something over 58,000 head we have exported from the port of Baltimore there have been only three or four cattle that have been so hurt in transportation as not to be fit to ship. That is a very small percentage. Some of the cattle are not detained in the yard the full twenty-four hours, because they have not had a long run—cattle coming from the vicinity of North Virginia and Pittsburg. The majority of the cattle remain there nearer thirty-six hours than twenty-four. So far as cruelty to cattle on board ship is concerned, the scales ought to be a pretty good index, and it is a fact easily proved that very many cargoes gain in transit across the water, and weigh more when they reach London or Liverpool than they weighed at the time they left our port.

Dr. MILLER: There is one point I had forgotten to refer to. The statement is also made by Dr. Bryden that the cattle are too long in transit across the country. After the cattle are loaded in East St. Louis, or in Chicago, or in Pittsburg, according to the regulation of the Department the Inspector at the point of loading shall notify me at Philadelphia, for cattle destined to Philadelphia, of their having been shipped. He must send me the list containing the number of the car, the railroad the car belongs to, etc. That list comes by mail. It is not sent by the train, as the manifest is. I can say that in about seven-tenths of the cases the cattle will be in Philadelphia, and I will get the manifest from the railroad company before I get that order through the mail, notwithstanding the cattle will have been unloaded and fed in Pittsburg. That shows whether they come through quickly or not.

Dr. FAVILLE: I have had the same experience two or three times.

Dr. BRYDEN: The method pursued at present in carrying out the shipment abroad is not one which will bring as good results, so far as freedom from hardship is concerned, as were obtained under the old system, when there were no regulations for the shipment of animals. The fact is, that they have attacked the wrong end. The inland trans-

portation has most to do with the condition in which the cattle are received abroad. You go to work and embarrass the ships; I say that is wrong. I simply make these remarks as showing that somebody has been doing an inconsistent thing.

Dr. MILLER: The gentleman makes a statement here which, if true in Boston, seems very strange. He said the United States Government had four steamship lines to do certain things. Now, it is a fact that all these arrangements have been brought about after having conferences with the agents of several steamship lines themselves, as well as of the agents of railroad companies. I have this directly from the Department. They inform me that these arrangements were made after a thorough consultation with several steamship companies' agents and the agents of the railroad companies, so that if the arrangements are not satisfactory to the transporting lines they have themselves to blame. He made the statement that distillery cattle had been shipped from Canada and elsewhere, and from twenty to twenty-five died on the wharves at a time in Boston. I do not know what kind of a distillery they feed up there. But it is not so down our way. Cattle were shipped through from Kentucky to Philadelphia during the hot weather last month with the single loss of but one animal; 639 head came all the way from Covington, Kentucky, and were loaded on the boat at Philadelphia within twenty-four hours after their arrival at that point, and every one of those animals was received from the distillery at that place, and but one died. If all the grievances exist that the gentleman complains of, he is guilty himself of not stopping them, as a simple complaint to the United States prosecuting officer would have brought the guilty party to justice. If he knew of these abuses he should have gone to the authorities and complained that the railroad people were wantonly killing the cattle. He is guilty himself if he did not make complaint. He should, if a citizen of the United States, have made complaint. He should have made complaint that the railroads and transportation companies were not complying with the law, and I do not believe anybody in the country would be more ready and anxious to punish the offender than the Secretary of the Agricultural Department.

Dr. BRYDEN: Instead of changing the spaces on the ship I should say it would be better to change the size of the stanchions. Do you mean to tell me, for a moment, that a great distillery is as good a place to ship cattle from as a stock-yard is? The chances for doing wrong in a stock-yard are entirely obliterated. I say, further, that instead of changing your ships, you ought to see that no animal of a certain grade is allowed to be shipped. That is the point. Make this a respectable business, and ship no cattle except it comes up to a certain grade.

Dr. FAVILLE: In conversation with the manager of the steamship

line running out of Baltimore, within the last week or two, he very emphatically said that if they could do away with the regulations established by the Agricultural Department, and which we are enforcing, that they would be most sincerely and emphatically opposed to it. In other words, they prefer to have the regulations enforced to the letter on all of their boats rather than go back to the old way of "go as you please."

RHACHITIS.

By W. L. WILLIAMS, V.S.

RHACHITIS is one of the most widespread maladies to which the animal kingdom is subject, and it may well be doubted if there exists a mammal or bird which is not liable to this disease.

It has been recorded in man, in all our domesticated animals and birds, and in many of the wild animals and birds confined in zoological gardens. So far as we can learn we have no record of the disease among undomesticated and unconfined animals or birds.

The etiology of this disease has so far baffled all investigations, although some of the conditions necessary to the development of the disease have been experimentally demonstrated. It is one of the oldest diseases known to medical literature, having been described by Vegetius.

The malady has received the greatest attention at the hands of writers on human medicine. This has been extremely unfortunate for medical science in general, inasmuch as with this narrowness of the field of observation, errors in our conclusions are apt to creep in, which in a broader area of study would be recognized and eliminated. Still more, we lose by this means of consideration, by excluding a large volume of material for study which is far more available than the disease in man readily offers, either ante- or post-mortem.

Much difficulty has been thrown in the way of the study of rhachitis in the lower animals by the extremely vague, erroneous and perplexing names under which it has been designated in its various manifestations and by various writers

In the Mississippi valley, and probably over the greater portion of the United States, solipeds offer the most abundant, available and richest field for the study of the malady, and certainly in no animal have English veterinary writers succeeded in more thoroughly confusing their readers, and in drawing their attention from rhachitis, to view under some other more mysterious name this disease under its different forms of manifestation.

One of the chief aims of this paper will be to draw your attention to rhachitis as seen in the horse, and thereby enlist your active study in what we believe to be a rich and promising, although sadly abused field. The classification of rhachitic diseases has long been a matter of great controversy, and no doubt many of you will dissent to that here proposed.

We find described in man two diseases, which if not identical are certainly very closely allied—rickets or rhachitis, and mollities ossium, or osteomalacia. Trousseau¹ asserts that the two are identical except in age of patient, while Bristowe,² although admitting their strong resemblance, believes that the details of anatomical changes are quite different. Without pointing out these differences, however, he recapitulates the symptomatology, morbid anatomy, pathology, course, termination and therapeutics of rickets, and leaves the reader at a total loss as to his reasons for his classification, and necessarily the impression that the two descriptions are of one and the same disease, with the difference that rhachitis occurs in adults and almost exclusively in child-bearing women.

The difference in the age of the patient seems at present to be the only tangible ground for the differentiation of these in man.

In the lower animals Prof. W. O. Williams,³ fails to draw any distinction between the various forms of constitutional bone diseases which he describes in such a way as to assist the student in differentiation between them.

Friedberger and Frohner,⁴ distinguish osteomalacia and rickets, by the fact that the former is a resoftening of the osseous system of mature animals in consequence of a resorption of lime salts, whereas the latter is a persistence of the soft condition owing to imperfect calcification.

They admit, however, that in many respects they are identical. They occur simultaneously in the same herd, and experimental research shows that the two diseases are developed in the same manner and by the same dietetic restrictions, and that the anatomo-pathological differences are those due to a similar if not identical cause acting upon bones which have undergone different stages of development.

It must be admitted by all that rhachitis does not consist merely

¹ Theory and Prac. Med., Bristowe, p. 809.

² Ibid., pp. 808-809.

³ Prin. and Prac. Vet. Surgery, pp. 178-190.

⁴ Spec. Path. und Therap. Zweite Auflage. Band ii. S. 21.

in a want of calcification, but in an actual decalcification of the bones already considerably developed, so that a one-year old foal may have lighter bones than at time of birth; so that both diseases or phases of disease must be due, not alone to a suspicion of the calcification process, but to decalcification of the bone already formed as well.

Professor Dieckerhoff fails to give so clear a conception of his idea as to the identity of these two diseases.

We find described quite commonly by veterinary writers several other diseases of domestic animals which, if not identical, are certainly closely allied to rhachitis, such as osteoporosis, articular rheumatism, and partial dislocation of patella.

Friedberger and Frohner,¹ who are certainly correct in their position, classify osteoporosis with rhachitis as one and the same disease, while Dieckerhoff² and Prof. W. O. Williams,³ dissent and maintain that it is a wholly separate affection. Under the head of partial luxation of the patella, Prof. W. O. Williams⁴ describes a disease of young animals attributed by him to grazing on hilly pastures, which in symptoms and course is quite identical with a malady happening not unfrequently in young animals grazing upon the level prairies of the Mississippi Valley.

While, it is certainly undesirable to group together diseases under one head which are essentially dissimilar in their etiology and pathology, it is equally unfortunate to dissociate phases of disease due to the same fundamental causes, and offering essentially the same characteristics.

In general, we would say rhachitis is a constitutional disease, affecting principally the osseous system and cartilage, characterized usually by an insidious chronic course, with a softening of the bones, increase in size with a marked decrease in the weight of earthy constituents owing to the resorption and excretion of earthy matter, especially of the phosphates and the salts of lime.

The affection occurs mainly in young animals, although no age is exempt. The symptoms vary to some extent with the species of animals, the violence of attack, age, etc., beginning usually with a general disorder of the nutritive functions of the body, probably a considerable degree of emaciation, a well-marked lassitude, visibly increased by exercise. In moderately severe cases a well-

¹ Spec. Path. und Therap. Zweit. Auflage.

² Lehrbuch. Pathol. u. Therap.

³ Prin. and Prac. Vet. Surg.

⁴ Ibid.

marked disinclination to move soon becomes apparent, and the patient ceases to join in the play of its companions. In lower animals the temperature is generally slightly, if at all elevated; while in children, it appears, there exists a reasonably well-marked fever, with a sensation of heat and with sweating, especially of the head and neck.

There is an increased tendency in all rickety animals to assume the recumbent position, especially well-marked in pigs and calves; less evident, however, in horses which, as is well known, naturally maintain the standing posture both in health and disease to a much greater extent than other animals.

Concurrent with or closely following these symptoms are other phenomena of a grave character. The general stiffness, the hobbling gait become more intensified, making it next to impossible in many cases for the animal to move, and it will do so only under the goadings of hunger, thirst, or extreme punishment. This stiffness is generally universal over the entire skeleton, but in many cases in the horse, especially those well advanced toward maturity, the cervical region seems to be the chief seat of pathological change.

In many cases this rhachitic inflammation of the neck develops quite rapidly, more so than most symptoms of this affection, and soon attains an exalted degree. The patient holds the head and neck perfectly rigid, as though the vertebræ were all ankylosed, the nose poked out like in poll-evil, the gait extremely stiff and careful, and in turning the animal does so very carefully and without bending any part of the spinal column. Any attempt to forcibly bend, raise or lower the head, causes evident pain, and the animal perhaps with a groan, attempts to escape punishment by stepping backward promptly. Some cases in this form are so severe that the animal is unable to get its head to the ground to eat or drink, nor can it reach to any height above its ordinary level to secure hay or other food from a high rack.

In all species of animals and in man there is a well-marked tendency to enlargement of the long bones at their distal epiphysis, especially of the radius and tibia, and in man and those lower animals having complete ulnæ and fibulæ, these are affected simultaneously. These epiphysial enlargements are characterized temporarily by lameness and pain on pressure, which in time may subside in one bone to appear elsewhere in another. In horses the lower ends of the cannon bones are frequently involved in this way, and occasionally we find the os suffraginis or os corona affected with a ringbone-like enlarge-

ment. In foals one to three years old there are at times noted inflammations of the small bones of the hock, especially of the cuneiform bones, resulting in large bony exostoses (spavins) usually affecting both legs, and symmetrical in size and form.

In young foals, three to six months old, while in good general condition, there frequently develops a rhachitic hydrarthrosis, especially of the stifle, more rarely of the tarsal or carpal joints, without in many cases evincing other evidence of disease. Sometimes but one stifle is affected, at other times both; at first usually unassociated with lameness, and may so remain throughout its course, or gradually developing, the amount of synovia increasing, the fluid pushing the patella forward, floating it away from its femoral groove and allowing it to slip over the condyle outward during the flexion, and slipping back in its groove with a snap during extension. In some cases the extensions of the synovial membrane about the peroneus and other muscles passing down over the stifle joint become greatly distended with synovia throughout their entire extent.

This synovial distention with patellar displacement cause the vasti muscles to assume a tense and rigid appearance, resulting later in atrophy, while the flexor tendons become somewhat contracted, causing knuckling over at the pastern. At the same time, owing to the extra weight thrown upon the well-nigh equally affected front limbs, they are, in order to relieve the posterior legs, bent forward at the knee and pastern joints, resulting in more or less severe contraction of the flexor tendons, occasionally to such a degree that the leg cannot be straightened sufficiently to bring the heel to the ground. The entire bony skeleton suffers in every part from enlargement and rarification, especially noticeable in the epiphyses or the long bones and in the flat bones of the head and face. In the horse, this enlargement of the bone is usually best observed in the living animal in that part of the superior maxillary bone bounded by the superior maxillary spine, infra-orbital foramen, and nasal bone, which by enlarging renders the ridge less distinct. Frequently, also, the thickening of the inferior maxilla is quite distinct. After death the region showing the greatest swelling is usually the anterior part of the superior maxillary bone, which during life is hidden to a great extent from observation by the superimposed tissues. This enlargement and thickening in the bones of the head and face is quite universal in rhachitis in men and animals. The cranial bones are arrested in development in young animals and retain something of the foetal type, this being especially notable in children and foals.

Nervous derangements have been noted in children, consisting in laryngismus stridulus, convulsions, and hydrocephalus. J. Bland Sutton, F. R. C. S., in a highly interesting article on "Rickets in Monkeys, Bears, and Birds," *Journal of Comparative Medicines and Surgery*, vol. x., p. 10, relates a case of blindness in a rickety Assyrian bear, due to pressure upon the optic nerve by the enlarged surrounding bony tissue. In one foal I observed blindness with apparently some degree of hydrocephalus, and a general want of mental activity was observed.

Deformities of the bony skeleton, due to the softened condition of the bones, occur in the more advanced stages of the disease, and depend largely in form and degree upon the habitual attitude of the patient. In children the deformities are largely those of the spinal column, thorax, and lower limbs, and the position of the spinal column being largely upright, leads to curvatures in various directions. In the horse the normal position of the body tends to confine spinal displacement mainly to a downward curvature (lordosis), but in rare instances we find an upward curvature (kyphosis) or a lateral curvature (skoliosis) or a union of the two latter (kypho-skoliosis). In pigs and calves the upward spinal curvature usually takes place. Fractures varying in degree are quite prone to occur in almost any part of the skeleton, sometimes complete, with marked displacement, at others only partial, with bending of the bone (green stick fracture), and may result from struggling when cast or confined, in attempts to rise from the recumbent posture, in the course of ordinary travel, or what we might term spontaneously from the contraction of muscles.

In the foal these fractures are seen most commonly in the dorsal or lumbar vertebræ during attempts to rise, and result in complete paralysis of the posterior parts, necessitating destruction of the animal. Partial fractures of the ribs, which occur, apparently, wholly without accident, but due to muscular contraction, are quite common, and can usually be discovered only post-mortem. Similar fractures, without apparent cause, occur in various bones.

In work horses, fractures of the bones of the legs are likely to occur suddenly while the animal is at ordinary labor, resulting in marked displacement and generally necessitating destruction of the animal. A lack of ossification and even resorption of osseous tissue has been noted in the cranial sutures of children, and we apparently have the same result to a certain degree in the case of a foal. The

changes in the nasal passage are of such an extent as to cause in some animals a marked difficulty in respiration.

This is recorded as being quite common in pigs, and is denominated "Schnuffelkrankheit" by the Germans, and the same difficulty is not very rare in rhachitic foals. Friedberger and Frohner attribute this dyspnoea to thickening of the bones bounding the nasal passages, and this is doubtless largely true, especially of the turbinated bones, but in some cases at least the dyspnoea is due rather to a thickening of the nasal septum by deposit between the two cartilaginous laminae of an abundant soft, spongy tissue, which increases the diameter to such an extent as to largely occupy the nasal passages.

In man and animals dentition is delayed, or at times even suspended, and the teeth already erupted become loosened in their sockets, pushed out of their regular positions, and may even drop from the mouth. In young patients the growth is generally impeded, emaciation is present in various degrees, and in case of recovery the individual usually retains a more or less dwarfed appearance, with short and somewhat crooked legs. When recovery takes place the deformities usually for the most part remain, rarely interfering with the usefulness of the animal, although much depreciated in value owing to unsightliness. Changes in the form of the pelvis are likely to occur which may render females more or less unable to successfully pass through parturition.

Of the internal organs, enlargement of the liver and spleen constitute the chief pathological changes recorded. The bowels are somewhat irregular, and in those animals in which phosphates are normally excreted by the kidneys we find the urine contains an excess of them, mostly in the form of calcium phosphates, while in solipeds, in which the phosphates do not normally appear in the urine, we find this replaced by a superabundance of calcium carbonate, giving the urine a very thick, muddy consistence.

Death from rickets is usually induced by bronchitis, broncho-pneumonia, asthenia, or in the lower animals to fractures which demand destruction.

Rhachitis in animals is largely confined to certain definite localities or environments. We have noted on three adjoining farms in central Illinois no less than twenty cases in horses during a practice of twelve years, and outside of this small area during the same time, taken altogether, we have not observed an equal number. Other practitioners record similar experiences, thus indicating that there are local causes capable of inducing it, while the occasional appearance of

isolated cases indicate that the same or similar conditions exist generally to a minor degree.

After recovery, there is in all animals a tendency to hyperossification and hypertrophy of bone, and in some cases cartilages which do not ordinarily ossify do so quite completely after rhachitis.

CASES IN PRACTICE.

A. An unusually large, heavy-boned, muscular, vigorous, full-blood, Norman colt, aged at present three and one-half years. He was unusually robust up to about the age of four months, when a synovial distention of one stifle appeared, soon followed by similar changes in the other leg. The enlargements slowly increased, lameness in both stifles supervening within a few weeks, coupled with some degree of emaciation and lassitude. The lameness gradually increased in severity until, eight or ten weeks after the inception of the malady, he could not rise without assistance, but once upon his feet, could manage to walk about the stall with difficulty, being quite rigid in his limbs and back. For three months the owner assisted him to his feet two or three times a day. Emaciation advanced rapidly during this time, but the growth of the foal suffered but little interference. The patellæ were soon floated out beyond their grooves so that they could readily pass out and in over the external condyles of the femur. The distended synovial sacs were tense, somewhat hot and tender. The relaxation of patellar ligaments permitting luxation of patellæ, with accompanying contraction of the vasti muscles, caused the stifle joints to be held in a peculiar extreme extension, with extension of the hock and very distinct flexion and knuckling of the fetlocks. The anterior limbs suffered similarly as the disease advanced, and the elbow joint became the seat of similar changes observed in the stifles, while the flexor tendons contracted to such a degree that the foal walked on the anterior part of the fetlock joint.

The appetite was good, temperature about normal, bowels somewhat constipated. At about the ninth or tenth month of age, or the fifth or sixth month of disease, the symptoms slowly abated, the colt gradually regained flesh and spirits, the synovial distention of stifles declined, while the ends of some of the long bones apparently thickened, and the bones of the head and face became distinctly enlarged. The contractions in the flexor tendons of the fore-legs persisted, and at about fourteen months tenotomy was performed. From that time he has gradually improved, and is now a horse of about 1750 pounds

weight, which is probably 300 pounds less than he would have attained barring accident.

He now has every appearance of health and vigor, has served mares readily and probably successfully, is reasonably active in his movements, although showing some degree of awkwardness and immobility; his stifles are still extended, the vasti muscles apparently stretched, and the patellæ still occasionally slip to and fro over the external condyle. There is some bending forward of the carpal joint, and apparently an increase in the normal curvature of the radius, probably also of the metacarpus.

Some two years prior to the affection in this colt a highly bred trotting mare, aged at the date of disease four years, property of the same owner and kept on same premises as above, developed extreme lordosis or sway-back, within a very few months, without revealing other symptoms of disease except slight stiffness of gait and a general lassitude. She made a prompt recovery, the deformity persisting.

In the year following that in which the colt became affected there occurred on the same farm no less than four cases of synovial distention of the stifle in sucking foals, some becoming quite lame, one or two suffering from emaciation, and in several there was partial dislocation of patellæ. Three of them have recovered, the other has markedly improved.

During the following season in 1890, one mild case of synovial distention at the stifle appeared, which has, it seems, recovered. At present one of the colts of this year's crop, in which four cases of synovial distention of stifle occurred, but not included in the four affected, he having always appeared in the best of health, has recently developed a tendency to hypertrophy of the splint bones, especially of those of the fore-legs, which now extend down to the enlargement at the extremity of the metacarpal bone, and are nearly one inch in thickness, giving the fore-limbs a very peculiar aspect. The animal is in perfect health apparently, and moves naturally.

Recently a four-year grade draught mare, in the same herd, has become extremely stiff and sore in her neck, walks stiffly, as though in pain, maintains the entire spinal column in a straight line, neck especially held quite rigid with nose poked out. Temperature slightly elevated (102° F.), pulse normal, appetite good, emaciation slight. Any attempt to forcibly raise, lower, or bend head or neck to right or left, causes great pain, and the animal starts backward to escape punishment. Enlargement of the facial bones is progressing slowly. The urine from this mare, and several of the colts, taken during the

active stages of the disease, show uniformly a large excess of calcium carbonate.

This group of cases on the same farm, and under the same management, demonstrates to an excellent degree the variations which this disease may assume. The first case serves as a connecting link between the rather common, mild rhachitic synovial distention of the stifle joints in young foals, and the enlargement of the facial bones known to English veterinary writers as osteoporosis. The enlargement of the facial bones in this animal is now so evident that no one could avoid so classifying it.

B. A full blood French draught-foal, age about eight months; location, the adjoining farm to *A*. When first observed the foal was down and unable to rise; assisted to its feet, it was unable to stand. There was complete paralysis of the posterior parts, with the appearance of broken back. The foal was destroyed, and an autopsy revealed a transverse fracture of one of the lumbar vertebræ with dislocation and pressure upon the spinal cord. The bones throughout the entire system were soft, porous and easily cut with a knife. Prior to my visit two or three foals of the same age had succumbed in the same manner, doubtless from fracture, and several more died after my visit.

These weanling foals were all kept in a warm basement, not greatly crowded, and were highly fed. All were unthrifty, emaciated, lame in various joints, stiff, some with arched backs, others the opposite. The disease was not confined at this date to weanling foals, but affected as well yearlings and two-year-olds kept in another part of the stable. One two-year-old colt exhibited the disease mainly in his hocks in the form of large bone spavins, causing considerable lameness and not yielding to treatment, while others of the same age showed principally the enlargement of the facial bones. Some seven or eight out of about twelve of the year's colt crop succumbed to the disease, the others recovered with so much deformity and interference with development that they were of little value for breeding purposes, for which they were designed. Of the older colts some four or five yearlings and two-year-olds became affected, with, as nearly as remembered, one death, the others recovered with persistent deformities, which largely diminished their value. The disease had been seen on the farm before, but there had been a lapse of several years. Two or three years prior to our date of observations, we saw on the same farm a yearling colt with supro-lateral curvature of the spine (kypho-skoliosis), which made a good recovery with slight deformity,

and sold at good price for breeding purposes. Subsequent to the time above mentioned, about 1885, no cases had been observed on this farm.

C. An eight-months common filly, of light breed, on a farm adjoining that on which the group marked A was kept. She appeared in her usual health until about three months old, when she ceased to grow, seemed unthrifty, would not join in the play and gambols of its associates. Its movements were slow, careful, and indicative of weakness. Within a few weeks extreme lordosis was developed, so that the middle of the back had sunken downwards fully five inches. When about eight months old the animal was procured for special study, and was led with difficulty about two miles, arriving in an exhausted condition. The temperature was slightly elevated, the appetite fair, the bowels somewhat constipated, urine scant and thick, and contained an enormous excess of calcium carbonate. There was extreme emaciation, with enlargement of the abdomen. The respirations were hurried and difficult, the dyspnoea being in part nasal, largely pulmonary. A white froth escaped from the nostrils in considerable amount. The lungs were somewhat dull on percussion throughout, especially marked at their interior border. Auscultation revealed slight broncho-pneumonia. The exertion required of the foal in traveling from the farm to the infirmary seemed to act unfavorably upon the course of the disease, and the patient rapidly grew worse, the pulmonary symptoms becoming aggravated until in about one week, it was found dead one morning upon entering the stall. The extreme lordosis so evident during life was not distinguishable after death—the relaxation of the muscles and relief from weight had caused the spinal column to assume its normal posture.

Autopsy revealed in the main : First, a well-defined thickening of the flat bones, especially of the face and inferior maxilla, pathological phenomena which thoroughly identified it in this respect with osteoporosis.

Second, curvature of bones as shown in one of the asternal ribs, antero-posterior curvature and a minor degree of lateral curvature of the same rib, irregular toward the head, and an anterior-posterior curvature of the radius beyond that observed in health.

Third, fractures of an apparently spontaneous kind and incomplete character (green stick) of three ribs. Two asternal on opposite sides, one sternal, and also a fracture of the left ramus of inferior maxilla. This bone also showed slight lateral curvature.

Fourth, an extremely light, porous, fragile condition of the entire bony skeleton.

Fifth, enlargement of the liver.

Sixth, diffuse suppurative broncho-pneumonia, especially marked at lower portions of lungs. Section of lungs showed hepatized pulmonary tissue with intervening yellowish-white collections of pus in bronchi and in cells.

This case illustrates, at one and the same time, with equal strength, rickets and osteoporosis.

D. A well-bred, trotting filly, age at beginning of observation, two and one-half years, when she exhibited a marked stiffness and soreness of the neck, so that she could with difficulty, lower her head sufficiently to graze. The neck could not be bent sideways nor the head elevated beyond the straight line without great pain to the animal.

Repeated severe blisters over the course of the cervical vertebræ caused a slow subsidence of the symptoms, which however, never fully disappeared.

Some months later, in addition to progressive emaciation, the animal exhibited signs of dyspnoea.

An examination of the nostrils showed the cause to be mainly a thickening of the septum nasi, and after a brief wait succeeding tracheotomy, when she began to gain in flesh and spirits, the septum was removed as high as practicable.

It was found to be almost one inch in thickness in the lower part of the nostril, the two layers of cartilage having been pushed apart by a spongy new formation. Higher up in its extent the cartilages approached each other, and the septum resumed about its usual thickness. Within a few days the tracheotomy tube was removed, and the case seemed to progress rather favorably for a time, but after several months the dyspnoea returned, and tracheotomy was again called to our aid, when we found, to our surprise, that at the seat of our former operation the trachea was thoroughly ossified for several inches and the tube much narrowed, necessitating a lower operation, which afforded but little relief, and the animal succumbed a few weeks later. Late in the disease thickening of the facial bones had progressed to a discernible degree, and when after death, prepared for preservation, it exhibited characteristic appearances. Autopsy further revealed old fractures of two or three ribs.

E. A well-bred roadster colt, age now three and one-half years. He is very large, muscular, and well developed, and has at no time

been debilitated or emaciated, neither has he exhibited any lassitude or disinclination to play with his associates. He became lame when about three months old, and exhibited hard osseous tumors at the lower epiphyses of the metatarsals and metacarpals, first appearing in one leg, remaining a few months, disappearing slowly and imperfectly only to reappear in another. Later, the lower epiphyses of radii and tibiæ suffered in a like manner, giving rise to enlargements of considerable size, which, like those of the cannon bones, have slowly disappeared. The last appearance of lameness was in one fore foot, where it has persisted now for more than a year.

This series of cases demonstrate reasonably well the symptoms and progress of rhachitis in the horse, and we believe serves to connect into one group, in a tangible manner, the varied phenomena observed in different individuals, and which, by various writers, have been separated into different affections.

The celebrated Jadelot cranium¹ bears a striking resemblance in many essential points to the rhachitic facial and cranial bones often seen in our patients.

The differential diagnosis of rhachitis in the horse is comparatively easy. It may be confounded: First, in quite young animals with pyo-septheemia or omphalo-phlebitis of newborn foals, which usually has a more or less clear history, develops as a rule within a few days or weeks after birth, generally shows some slight indication of infection at the umbilicus, the joint complications are more sudden and severe, and the epiphyses of the long bones are not affected.

Second, in animals of diverse age, accompanied by lameness or stiffness of neck, with articular rheumatism, which is more sudden in its onset than rhachitis, more prone to metastasis, and affects the joint, not the epiphysis.

Third, in cases of facial enlargement, with odontomes, or other dental affections, which, unlike rhachitis, are seldom symmetrical, and rarely show in that part of the face most prone to rhachitic change, are usually sharply defined in outline and, except respiration or mastication is interrupted, they rarely affect the general condition of the animal unfavorably.

Fourth, in those cases of cervical rhachitis, with cervical articular glanders, which is more sudden and severe in its onset and usually exhibits laryngeal or pulmonary symptoms (cough) or farcy.

The etiology of rhachitis is not yet definitely determined. Climate,

¹ Journal of Comparative Medicine and Surgery, vol. x, 1889.

altitude, geological formation, species, breed, food, and housing seem incompetent to prevent it, as sporadic cases appear everywhere. And yet there is something about food and environment which makes the disease common in one locality, rare in others. It has not been recorded in free wild animals and birds, while those confined in zoological gardens suffer very seriously from its ravages. In the crowded tenements of London it proves a veritable scourge among the children of the poor, and yet it appears, although far less rarely, in the homes of the wealthy and under the best known sanitary regulations. It seems also that in those localities where rickets prevails it confines its ravages mainly to one species of animals. In one locality it apparently affects mainly cattle, in another, pigs, in another, colts. The character of the available literature gives no clue to the grounds for this apparently peculiar condition. Possibly it may be due to the fact that the disease attacks mostly that species of animal to which most attention is paid in a given locality, and hence a higher state of domestication and more confining environments.

Roloff and others have produced the disease by experimental feeding of animals on food deficient in lime and phosphorus, thus producing experimental lime starvation, while on the other hand the Kleie or Krusch-Krankheit of the Swiss veterinarians is brought about by feeding bran or pollard, which is excessively rich in the earthy constituents of bone, and the rhachitis of horses in central Illinois cannot be referred to a lack of these earthy salts where they get an abundance in both food and water.

Another evidence that it is not phosphorus or lime starvation is the fact that in the active stages of the disease an extraordinary amount of these salts are being constantly eliminated as calcium carbonate in the urine and the phosphates, probably in the feces in solipeds and possibly other animals; while in those animals which normally excrete phosphates in the urine, the superexcretion of these constitute one of the most constant and pathognomonic signs.

We must consequently conclude that the disease is not so much due to lime starvation as to mal assimilation of the ingested salts along with a solution and resorption of the osseous tissue already formed. The exact character of this process is the most stubborn and yet the most important question now confronting us in the study of this malady. The etiology of the disease being in doubt, renders our efforts at therapeutics at least uncertain, if not impotent. Many writers have commended the administration of phosphates, but when the excretory organs are already overtaxed in throwing out these

salts, it seems folly to furnish more to be excreted, and in fact, clinical experience has failed to discern benefit from this line of treatment. Cod-liver oil has long been considered the best remedial measure known, although its action seems not to be understood. Locally, much can be done at times to relieve urgent or unfavorable symptoms. In cervical rhachitis, vesicants and cautery seem to afford relief. Tenotomy may prove necessary in case of contractions of the flexor tendons. Iodine blisters may exert a favorable influence in checking bony deposits during the convalescing stage.

DISCUSSION.

Dr. MILLER: I wish to say that I consider it one of the best papers on that subject I have ever had the pleasure of listening to. I was interested in the case of a colt which was similar to the case cited. I had under my treatment a similar case. The cases were almost identical. The colt belonged to Dr. Agnew. There was the enlargement of the bones and everything else. Before the colt died the limbs softened so that the legs separated at the joints. The Doctor would not allow the colt to be killed, as he wanted to keep it in the interest of science, simply to see how long the colt could live in that condition. The colt lived thirty-six hours after the legs began to drop off. The bones were placed in a barrel, and there are many that have already crumbled and gone to pieces.

Dr. FAUST: The hour is too late to give this paper a full discussion. This is the first time to my knowledge that I ever heard in the English literature that these three diseases were identical in their pathology. I refer to "rhachitis," "osteoporosis," and "osteomalacia." My heart jumped for joy when I found somebody to think as I had thought, and as I have found universally accepted in the best German works.

Dr. BERNs: I was very much interested in it, and I think a good, thorough discussion on the subject would be not only interesting but beneficial to all. But as the hour is getting so late I would prefer that the discussion lay over until our next meeting. The paper is a lengthy one. We need more time to study it carefully, and such study will conduce to a more intelligent discussion when the matter comes up again. I hope the discussion will be laid over until the next meeting.

The PRESIDENT: If there is no objection it will go over. I think the suggestion is a good one. I agree with what Dr. Faust has said. I am glad that someone has made public the identity of the three diseases.

THE IDENTIFICATION OF ANIMALS.

By R. S. HUIDEKOPER, V.S.

THERE is, perhaps, no part of veterinary practice or animal commerce in which there is a greater want of method, laxness in detail, and carelessness in recording than in the description of the subjects handled and in the noting of points which will establish the future identification of an animal. For the ordinary layman an equine is a horse or a mule, a bovine a cow, and a canine a dog, irrespective of age, color, sex, or condition of servitude. A stallion is a rarity, a steer is a beef animal, and by many a bitch, bull, or gelding is not considered as mentionable in polite society. This inattention to definite terms leads not only to vagueness in veterinary writings, but also frequently causes the writer to commit errors in English which could have been avoided by a definite fixation of the subject-matter.

In the description of an animal for veterinary purposes, whether in an expert examination for soundness, in judging, or in a legal controversy, or in a clinical description, or for registration in a stud-book, a definite course of examination and a methodical system of recording should be observed. If this is done, and the written description follows the same form in every case, it educates the observer to note the small and sometimes apparently trivial differences which at times are the important points upon which an identification is based.

The table below outlines the course to be followed in an ordinary record of the identification of an animal :

I. DESCRIPTION OF ANIMAL.

- a. Species of animal, race, family ;
- b. Sex ;
- c. Age ;
- d. Height and weight ;
- e. Color ;
- f. Accidental markings ;

II. DESCRIPTION OF ABNORMAL OR PATHOLOGICAL ALTERATIONS.

With the domesticated animal, custom has established certain specific terms which define species, sex, and age; and these should be used according to their exact meaning, and with no other meaning, so far as possible, in all expert writings.

GENUS EQUUS; *Species Caballus*. Specific term, Horse. The animal is—a *foal*, irrespective of sex, from birth until weaned; a *weanling*, when weaned until it becomes a *yearling*. The male animal is—a *colt*, until the mouth is made, or until castrated; custom has, however, accepted the first indication of the corner teeth of four years as the age at which he becomes a horse; a *gelding*, after castration, at any age; a *horse* or *stallion* after the mouth is made, or earlier, if he stands for service; a *ridgling*, if one testicle has not descended to the scrotum. The female is—a *filly*, until the mouth is made or until bred; a *mare*, after the mouth is made, or sooner if bred.

Species Asinus. Specific term, Ass. The ass is—a *foal* until weaned; after that the male animal is a *jack*; the female animal is a *jenny*. The male mule is known as a *jack mule*, irrespective of gelding, and the female as a *jenny mule*. The hybrid foal of the male ass and the mare is the true mule. That between the stallion and the female ass is called the *hinny*.

GENUS BOS; *Species Domesticus*. Specific term, Neat Cattle. The animal is—a *calf* until six months old (the natural time for weaning); a *bullock* is a young bull, or any male of the ox kind; a *bull* is the male animal; a “*steer*” is the castrated male of neat cattle. He is called an ox calf, or bull calf, until he is twelve months old, a *steer* until he is four years old, and after that an ox or bullock” (*vide* Youatt); an ox “*steer*”; a *stag* is a castrated male; a *heifer* is the female until bred, or until the mouth is made; a *cow* is the female after breeding, or when the mouth is made.

GENUS OVIS; *Species Aries*. Specific term, Sheep. The animal is—a *lamb* until a year old; a *ram* or a *tup*, when male over eighteen months old, and has its first intermediate permanent teeth; a *ewe*, when female over eighteen months old, and has its first intermediate teeth; a *wether*, when a castrated male; a *hog-hogget* is the young sheep before it has been shorn.

GENUS CAPRA; *Species Hircus*. Specific term, Goat. The animal is—a *kid*, until a year old; a *billy* is the male; a *nanny* is the female.

GENUS *SUS*; *Species Scrofa*. Specific term, Swine, Pigs, Hogs. The animal is—a *suckling* until weaned; a *roaster*, from four until eight weeks old; a *pig*, until a year old, male or female; a *porker*, *porket*, or *porkling* is a young hog or pig; a *boar* is the adult male; a *sow*, the adult female; a *shoat*, *shote*, or *shoot* is a growing hog; a *barrow* is a castrated hog; a *farrow* is a litter of pigs.

GENUS *CANIS*; *Species Domesticus*. Specific term, Dog. A *puppy* is—the young; a *dog* is the male; a *bitch* or *shut*, the female (the former term is preferable).

GENUS *GALLUS*; *Species Domesticus*. Specific term, Chickens, Barnyard Fowls, Pullail. A *cock* is the male; a *cockerel* is a young cock; a *stag* is a young game cock; a *capon* is a castrated male; a *hen* is the female; a *pullet* is the young female; *poultry* are the fowls fed for the table.

AGE.—Beyond the definitions made by the specific terms just mentioned, the question of age is too long a subject to enter into in a paper of this kind, and is also one which has been made the subject of such minute study and description in numerous writings that they can be referred to for accuracy.

HEIGHT.—The horse varies from 9 hands to 22 hands in height; under 14 hands he is known as a pony; cobs measure from 14 to 15½ hands. Some of the great Belgian and English draught-horses reach 18 hands or even more. Barnum showed, a few years ago, an ungainly broken-kneed bay coach-bred gelding that measured 22 hands. On a written certificate the heights should be given as under standard (S) or estimated (E). The height is taken at the highest bony point of the withers, the spinous process of the seventh dorsal vertebra. Care should be taken to see that the horse being measured is standing on an exact level with the examiner and the instrument used. The ordinary form of instrument used is the *standard*, a rod six feet in height with a movable cross bar, the latter usually fitted with a spirit level. Care should be taken to see that the upright is perfectly vertical, as a small inclination will make an important difference in the horizontal bar. When there is a decided difference in the height of the withers and croup, as sometimes occurs, it should be noted, but the record is taken from the former. It must be remembered that in double teams the form and style in carrying the head will frequently render two horses a good match when the standard shows a decided difference in their height.

WEIGHT.—The question of weight in the description of horses is

a custom almost exclusively American. The average weight of an ordinary horse is about 1000 lbs.

Ponies are under	800 lbs.
Light roadsters	950 "
Ordinary roadsters and saddle-horses	950 " to 1150 lbs.
Coach horses	1000 " " 1350 "
Light draught-horses	1000 " " 1350 "
Medium draught-horses	1350 " " 1500 "
Heavy draught-horses	1500 " and over.

With a severe fever or other illness a horse may lose 25 lbs. to 40 lbs. a day, 200 lbs. in a week.

COLOR.—The "coat" of animals is made by an *ensemble* of the color of the skin itself (epidermic pigment), the character and color of the hairs, and the products of secretion and excretion of the glands of the skin (sebaceous and sudoriparous glands).

In wild animals the coat is almost invariably distinctive of the species of animal, although varying frequently somewhat with the age of the animal and with the sex. In all animals the hairs are generally coarser and longer over the neck and withers in the male than in the female; and the color of the former is, in most species, darker and more pronounced than that of the latter. But while wild animals have usually a uniform color, domesticated animals and many wild ones which have been bred in captivity are subject to great variation in color, and their coats are subject to the introduction of white, which is rare in wild animals.

THE SKIN.—The skin may be pigmented throughout with a deposit of a leaden or brick-dust color, which may even extend to the mucous membrane of the nostrils, tongue, and hard palate, or the pigment may be entirely absent, or may be absent only from certain parts; in the latter case it is usually absent from the neighborhood of the natural openings, the lips, the eyelids, the genitals, and the anus, and from the extremities, pasterns, fetlocks, legs, and face.

THE HAIRS.—*Character.* The hairs are of two sorts; the hairs proper, which cover the surface of the body, and are short, fine, and soft, and lie closely together in a definite direction for each given part of the body. These are shed annually or oftener. The longer coarser hairs which, under the name of mane, forelock, tail, tentacles, eyelashes, moustaches, and whiskers, grow from the crest of the neck, the tail, the eyelids, and the lips, and on the fetlocks of coarse-bred animals are persistent. The hairs of the hog are always coarse,

and are called bristles, and those of the sheep, of great fineness and crinkled, are known as wool; both of these terms are used for the hair of the other animals when, in its texture, it resembles them.

Color. The colors of animals are not as brilliant as those of a flower or of the plumage of birds, but we can recognize that, like these, they are based upon the primitive colors of the prism, red, blue, and yellow. In the horse we have as primitive colors a modification of—*red*, bay and chestnut; *blue*, steel-grays and mouse color; and *yellow*, duns; *white*, absence of all colors; and *black*, presence of all colors. From modifications in the shades and tints of these and from combinations of them we have the colors of the coats. Professor Neumann divides the coats into three categories: 1. *Primitive coats*; 2. *Derived coats*; 3. *Conjoined coats*.

Primitive coats are those which the animal has at birth. *Derived coats* are those which appear after birth and are due to the introduction of white. *Conjoined coats* are those in which there is the presence in the same animal of two coats, primitive or derived.

1. PRIMITIVE COATS form three groups.

- A. *Simple coats*, with but one single color, as black or sorrel.
- B. *Composite coats*, formed of hairs of two colors, black for the mane, tail, and extremities, and yellowish, reddish, or bluish for the body, as the dun, bay, or mouse color.
- C. *Mixed coats* are made of hairs composed of two colors, usually yellow at the base and black on the end; this is a rare color, and when it exists in the horse is often improperly confounded with the roans.

A. *Simple coats.* The simple coats are those made of hairs of but one color, the *black*, *sorrel*, or *chestnut*; Goubaux and Barrier exclude the *white* as a color, as in the so-called white horse there is invariably more or less trace of black or other color, making it very light gray. If it can be shown that absolutely white (not albino) horses exist, then white can be included as a simple coat.

a. *Black.* The black may be a dull, uniform, dead black without any reflecting tints, or the latter may be so marked in reddish or yellowish hues as to confound the coat with that of a brown bay. It may have the brilliant reflection of jet.

b. *Chestnut or Sorrel.*¹ This is a yellowish or brownish red, which comprises many shades. Commencing with the lightest in colors there is: 1. The *cream color*, which may be subdivided as light,

¹ These terms are used as synonymous.

ordinary, or dark ; 2. The *light sorrel* has a decidedly yellowish tint, like the coat of the lion. An ordinary chestnut turned to pasture for a month will sunburn into this color ; 3. *Sorrel* or *chestnut* (ordinary) is a cinnamon color, the hairs of mane, tail, and legs must have the same color as those of the body ; 4. *Washed sorrel* is a degenerate light sorrel, but the legs, mane, and tail are very light or almost white ; 5. *Dark sorrel* is a brownish cinnamon color ; 6. *Cherry sorrel* has a decided bright red tint ; 7. *Chestnut* (proper) is a rich uniform brownish red, like that of a ripe chestnut ; 8. *Burnt sorrel* is a dark rich brown, like roasted coffee. Horses of this color invariably have more or less white hairs sprinkled over the body, and a mane and tail of almost a white or silver color. According to the reflection of the tints of a sorrel it may be golden, fox (copper), or bronze. White marks on the head and legs of sorrels are common.

B. Composite coats. Composite coats are those with two distinct colors, a reddish, yellowish, or bluish one for the body, and black for the mane, tail, and legs ; they are the *dun*, *bay*, and *mouse* color.

a. Dun. The dun has yellowish hairs over the body, to the knee and hock, and over more or less of the face. The mane, tail, and hairs on the cannon and fetlock are black. A dun may be *light*, *ordinary*, or *dark*, in the latter case taking the name of *buckskin*. Duns frequently have a black line running along the centre of the back, the black cross of the ass on the withers, and the transverse black marking of the zebra on the legs. The light dun is sometimes almost the same as a *cream color*, but can always be distinguished from it by the presence of black on the extremities. The dun is known in French as an *Isabelle* ; according to Bouillet, *Dictionnaire d'Histoire et de Géographie*, the Archduchess Isabelle of Austria, daughter of Philip II. of Spain and ruler of the Netherlands, accompanied her husband at the siege of Ostend and made a vow not to change her linen before the conquest of the place. The siege lasted from 1601 to 1604, and the color of the chemise of the Princess gave origin to the name.

b. Bay. In the bay the color of the body is a red, which may vary from a cherry to a mahogany, and is distinguished from any similar shade of sorrel by the presence of the black mane, tail, and legs, although in the last the black may be reduced to a narrow circle of black hairs around the coronary band. The *bays* are : 1. *Light bay*, these frequently have the black cross and zebra stripes on the withers and fore legs. 2. *Bay* (ordinary), distinctly red. 3. *Blood bay* (mahogany), darker. 5. *Dark bay*, approaching brown.

6. *Brown bay* or *brown*, becomes nearly black in winter, but always has a reddish tint around the muzzle, armpits, belly, flanks, and thighs, while the sunburnt *black*, in summer, is black in the same places.

White markings on bays are usually less frequent and less extensive than on sorrels.

c. *Mouse color*. The mouse color is less frequent in the horse than in the ass and mule. It is an ashy blue over the body, while the mane, tail, and legs of the animal are black. It is frequently accompanied by the black cross and zebra stripes.

C. *Mixed coat*. This is a rare color, composed of hairs which are yellow at the base and dark at the tips, like those of wolves and some wild animals. It is probably usually confused with the roans, but should not be.

2. DERIVED COATS.—Derived coats are those due to the introduction of white into the primitive coat at some period after birth; they are the *grays* (including white) and *roans*.

A. *Gray*. Goubaux and Barrier say: "Classically, gray is a mixture of white and black hairs. Practically, it is far from being so. Take by chance ten gray horses, and it is readily seen that this definition is not sufficient. The dark hairs are *not always black*. They are often brown, chestnut or reddish (bay), more rarely yellow. The *white* hairs are sometimes washed yellow." Brivet says: "The gray coat is excessively variable in tint; it is a sort of chaos mixed with hairs of different shades."

The gray is a mixture of light and dark hairs over not only the body but also in the mane, tail, and legs; it can have for basement color black, bay, sorrel, or dun. A gray may be: 1. *Very little gray*, showing only a few dark hairs, usually called white; 2. *Light gray*, with more dark hairs, especially on mane, tail, and legs; 3. *Gray* (ordinary), with about an equal mixture of white and black hairs; 4. *Dark gray*, with a predominance of dark hairs; 5. *Iron gray* (steel), with a bluish tinge, like that of a freshly broken piece of steel (a darker shade might be called *slate colored*); 6. Grays can further be distinctly characterized as *dirty*, *dun*, or *roan* grays.

Grays usually become lighter as the animals become older, so that at different ages the same animal would need an altered description. The *white*, if recognized as a coat, or in an ordinary case when it is a coat derived with age from the grays, is *milk china* (bluish), *dirty*, or *rose* white; these qualifications indicate the tint given to the white without further explanation.

The *strawberry roan* (or peach) is a sorrel with numerous white hairs in body, mane, and tail; it may be light or dark. A strawberry roan is always much lighter after clipping.

B. *Roan*. The roan has a coat with three colors of hairs—black, reddish, and white, that is a body with numerous white hairs over the body. It may be *light*, *medium*, or *dark*. According to the color of the hairs which predominate and the distinctive tint of the roan, it may be further qualified as a *blue* roan, a *red* roan (not to be confounded with *strawberry* roan, white and chestnut), a *white* roan, etc.

3. CONJOINED COATS.—They are those in which the same animal has two or more distinct primitive or derived coats on different parts of the body. They are represented by the *piebald* or *skewbald*, which has a mixture of large white patches with other colors. The piebald strictly is a mixture of white and black, like the magpie, from which it takes its name, but by custom includes the others; "*pie*" refers to the white; for more definite description we may consider: a *pied-black*, a *pied-sorrel*, a *pied-bay*, a *pied-roan*, or a *pied-gray* as a black, sorrel, bay, roan, or gray with larger patches of white than of the dark color, while a *black-pie*, a *sorrel-pie*, a *bay-pie*, a *roan-pie*, or a *gray-pie* is one in which the white is of less extent. We may also describe the horse as being *pied*, on near or off, belly, side, withers, or wherever the white may be. The color of the mane and tail should be indicated if the *pie* is a mixed one.

In rare cases there are horses with conjoined coats of black and bay, two colors of bay, dun, and gray, etc. These may be indicated by special description as *pied* of such and such color.

Spotted (tiger spots). Spotted horses are found especially in Denmark and from the valley of the Danube, and in the United States from Virginia and Michigan, which can be described as of such or such a color, spotted with such or such a color, the size of spots and location to be given.

SPECIAL MARKINGS.—In addition to the color of the coat it may have peculiar growth of the hair, tints, or discoloration, which give it a characteristic effect and serve to identify the animal.

They may be divided into :

1. *General Markings.*
2. *Markings of the head.*
3. *Markings of the body.*
4. *Markings of the legs.*

1. GENERAL MARKINGS.—This comprises reflection of color, dark hairs, white hairs, black hairs, reddish hairs, cowlicks, and discoloration of the skin.

Reflection of color may be called : *jet*, if a brilliant black ; *silvery*, if a bluish, porcelain white ; *golden*, for rich sorrels, bays, and duns ; *bronzed*, for metallic reds and browns ; *watered*, when presenting alternate shades or undulations of color.

Darker hairs. *Dapples* are spots usually the size of a silver dollar, composed of darker, more brilliant colors than those of the rest of the body.

White hairs. *Absence* of white hairs defines a horse as *solid* in color ; *scattered* white hairs, when not of sufficient number to make a derived coat, should be noted : *fringed*, is a mixture of white hairs and those of the coat of the animal surrounding a circumscribed white spot.

Careful attention should be given to noting the difference of natural white markings and not to confound them with *accidental white*, which is the result of wounds, accidental scars, rubbing of harness or saddle, and blisters.

Black hairs. *Fly-specked* is said of small spots or black hairs seen most frequently in grays, sometimes in chestnuts, bays, and duns ; *ermined* is the presence of larger spots of black, occurring most frequently in or along the borders of white markings ; *burnt* is the black shading of various coats, most commonly seen in sorrels.

Red hairs. *Flea-bitten* is said of small spots of red hairs over the body and more frequently on the head and face, this is most frequently seen in old grays ; *sunburnt* is the reddish hue often seen in blacks ; *roan* (adjective) is the qualification used when reddish hairs appear over a gray, as *roan gray*.

Direction of hairs ; Cowlicks. Cowlicks are hairs running in irregular directions from or to a given point ; if the first they are eccentric, if the second concentric. They occur on all horses in the centre of the forehead, on the breasts, and on the flank. They may occur at other parts of the body and should then be noted, marking the size of the cowlick and direction of the hairs. They are apt to occur in rich colored coats, and are often very distinctive of family. The trotting horse *Commonsense* is peculiarly marked with them. The Arabs consider them a mark of great quality. *Feathered* is the term used when the divergence or convergence of hairs takes place from an elongated centre.

Discoloration of the hairs or skin. *Washed* is the term given to

the faded tint seen with many coats. In bays it is found in the light or yellow-colored legs ; it is frequent on the legs of sorrels.

Leprous spots denote the absence of pigment from the skin in spots or patches of variable size. They are frequent on the genitals and lips, often occur on the eyelids, anus, and under the white hairs on the extremities, and may be found on any part of the body. If these patches have spots of pigment in them they are termed *marbled*. Geoffroy St. Hilaire, Curnieu, and Goubaux have noted horses entirely denuded of hair.

2. PECULIARITIES OF THE HEAD.—White may be present in variable extent, but is usually in more or less definite form, and takes with each a specific name.

A *star* is where the hairs make an eccentric cowlick, running in all directions ; a *flame* is where they run in one direction from a cowlick, and the direction should be noted as to right or left, or if in the rare direction, downward ; a *shield* is in the form indicated by the name ; a *crescent* (quarter moon) faces up or down, to the right or to left, and should be so noted ; a *blaze* is a white stripe down the face, it may be to right or left, may commence above with a star and may terminate below with a white nose or with leprous markings ; a *snip* is a little stripe of white on the nose ; *bald face* is where the whole face is white.

Any of these markings may be ermined or fringed. The face may be fly-specked or flea-bitten.

Moustaches, or excessive growth of rather coarse hairs, are at times seen in the upper lip of horses, especially those with Irish or Breton blood, from Vermont and Canada, hackneys, etc.

Grays, roans, and duns have at times very dark, almost black, faces, which are characteristic.

Wall-eyed is applied to eyes in which the dark pigment of the iris is replaced by a light gray or bluish white. It may be complete or incomplete, and may affect only one or both eyes.

Brivet says that wall-eyed horses do not see well in the dark. The ordinary pigment in the eyes is sometimes replaced, in one or both, by a tawny yellow or wine color.

3. MARKINGS ON THE BODY.—*Mule stripe* is a black or dark red stripe extending on the median line from the withers to the base of the tail ; *the cross* is a stripe at right angles to the mule stripe from the withers down the shoulder ; *white or washed hairs* may occur in patches over the body ; *zebra stripes* are transverse black bands seen usually on the upper arm, sometimes as low as the knee.

4. MARKINGS ON THE LEGS.—White on the extremities is described as “white,” “coronary,” etc. ; “pastern” or “fetlock” when it simply surrounds the coronary band, covers the pastern, or reaches the fetlock ; a *stocking* is white reaching to the knee or hock ; a *half-stock* reaches half-way up the cannon. These white markings may be *incomplete* (internal or external), *fringed*, *ermine*, *flea-bitten*, etc. When white occurs on one leg only, the leg is indicated. When on two they are defined as anterior biped, posterior biped, or diagonal biped (left or right), according to the fore leg of the diagonal. When three legs are white they are described white *except* the odd leg.

Identification may be made more complete by indicating the complete or partial want of pigment in any of the hoofs.

REPORTS.

REPORT OF THE COMMITTEE ON INTELLIGENCE AND EDUCATION OF THE U. S. V. M. A., FOR THE YEAR ENDING SEPTEMBER, 1891.

MR. PRESIDENT AND GENTLEMEN: As Chairman of your Committee on Intelligence and Education, I have the honor, for the second time, of submitting our annual report for your consideration.

Soon after receiving official notice that I had again been distinguished with the confidence of our President by being appointed to the chairmanship of this committee for another year, I placed myself in communication with the other members of the committee, and after a due amount of correspondence with them, I have compiled the following statement of the results of our labors.

The conditions which obtained at the time of my last annual report obtain to-day, and what I wrote regarding the status of our profession at that time applies with equal force at the present. There is nothing in it which I wish had remained unsaid, although there is much which might have been said then that was omitted from lack of time and for fear of making the material too ponderous to be interesting. It is my intention now to say a few words more upon the subject of education, and to conclude with a few words upon topics to which I think it would be well to call your attention.

So much has been said and written upon the matter of veterinary education in America that I have no expectation of advancing any new or original ideas, but simply to reiterate and emphasize a few of those that have already been advanced, with the hope that this Association will bring all its influence to bear in demanding progressive action and improvement in all the institutions of veterinary learning upon this continent, to which we have to look for future members of our organization.

If we look at the history of medicine in this country, and compare the history of veterinary medicine with it, I do not think that the outlook is so discouraging as many of our pessimistic writers would have us think.

It is not such a great many years since most, if not all, of the medical

schools on this continent required but a two years' attendance, and when the matriculation requirements were much less stringent in them than at present. As the medical profession grew in influence and wealth the leading schools extended their course to three years, and made the requirements for admission higher, until to-day we hear that next year the Harvard Medical School and the Medical Department of the University of Pennsylvania are to increase the regular course to four years, as their faculties have decided that three years is too short a period of study in which to acquire a sufficient knowledge of the science of medicine and surgery with which the young practitioner is to be turned loose upon an unsuspecting public. Heretofore American dental degrees have been the only ones in the field of medicine entitled to any consideration in Europe, and dentistry is the only branch of surgery which Europeans have come to this country to study; but this advance in two of our leading medical schools is a step toward securing more recognition for graduates of American medical colleges abroad, or for the graduates of these two schools at any rate, and it is not impossible, nay, it is even probable, that before many more years elapse there are certain branches of surgery and medicine that foreign physicians will find it to their advantage to come to this country to study. This seems to be particularly true when we consider the magnificent hospital and clinical advantages that are now offered in connection with the courses at the leading medical schools in many of our great cities.

It does not seem to me that it is very difficult for us to draw a parallel between the progress of medicine in this country and that of veterinary science; our profession being, perhaps, thirty or forty years behind her older sister. It is but a few years ago that there were but two veterinary colleges in the United States, both in the city of New York, requiring attendance at but two short winter sessions, and having a matriculation requirement that practically had no existence at all. With the addition of two Canadian schools there were but four for this great continent, only one of which required a three years' attendance, and was regularly a branch of a university, the other Canadian school being in all respects no better than those in New York. Since 1883 several other institutions of veterinary learning have been established, some like the old two-years' schools, requiring no longer a course of study, and hailing all comers with open arms, no matter what their previous conditions, associations, or educations may have been. Others connected with universities of different kinds established a three-years' graded course, and made a pretence of having some sort of a matriculation examination. How well they have lived up to it those having inside sources of information can tell you much better than I. Then some of our agricultural colleges have established veterinary departments, and even go so far as to grant veterinary degrees.

This is the condition of affairs to-day. It certainly shows many changes within a few years. They do not appear to be for the worse; let us hope, then, that they are for the better.

The recognition of the veterinary profession by the University of Pennsylvania and Harvard University certainly shows an interest on the part of these institutions of learning in this branch of medicine, even if the conception of the moving spirits, in one of them at least, as to what veterinary science is may be rather crude and visionary.

The course at these two schools, although having the advantage of being graded, greater length, and having a certain standard of admission, is counterbalanced in many ways by the cram course schools. Provided the student entering the latter has sufficient perception and education to understand properly what is taught him, he is likely at the end of two years to know quite as much as the student at the other schools does at the end of three years, for the reasons that the faculties at many of the short-course schools have more veterinarians among them, and the student thus has the advantage of the training and ideas of a number of different men, instead of a very few, perhaps the few being the original veterinarian connected with the school, with some of those who have graduated under his pupilage, thus leaving it but little better than a one-man institution. Furthermore, the clinical advantages at some of the shorter-course schools are very much better than at the longer-course ones, the hospital practice and out-patient departments being more extensive, the students in one often seeing more surgery and more interesting cases in two short winters than those in the other would see in three long years. In one instance, at least, the great university establishing a veterinary department went so far as to ignore the existence of any veterinary profession at all in the city where it was established, and in order to get clinical material for its students, and make both ends meet (not having waited until it had any endowment fund) it did ridiculously cheap work, to the detriment of existing practitioners and such of its own graduates as settled near it.

Besides the veterinary schools, pure and simple, we have to consider the veterinary departments of agricultural colleges, and perhaps I can best do so by quoting from a letter of a member of this committee, Dr. Gerald E. Griffin:

"If the courses are too short and the examinations easy in the regular veterinary schools, surely to Heaven it must be a farce indeed to call a man a veterinarian who graduated from an agricultural school, where he is confined to the conservative ideas of one surgeon, who may not intellectually be far above the average; again I protest against the recognition of these schools by the Association as veterinary institutes and against the recognition of their graduates as veterinarians."

While I agree with Dr. Griffin to a certain extent, and think it would

be much better if agricultural colleges did not grant veterinary degrees, at the same time they do grant them, and I do not see how we can very well help recognizing them. Their bearers are certainly educated men ; they have a much better general education than most of our veterinary graduates, and in many ways it more than compensates for the greater amount of veterinary training that may be given a man who is so ignorant that he can barely write his own name. If the graduate of a veterinary department of an agricultural college is not fitted for the duties of a practitioner the great American public is smart enough to find it out, and his pocket-book is the main sufferer, unless, as is occasionally the case, he is an able enough political wire-puller to hoist himself into a Government office of some kind.

Having tried, in as few words as possible, to describe the condition of our veterinary schools, we have to consider the means for their improvement, and the matter has received quite as much attention from the pens of our veterinary writers as the standing of the schools themselves.

All manner of remedies are suggested, chief among which are endowments for veterinary colleges from the National Government, with governmental supervision, a uniform standard for admission, and a National Examining Board to examine applicants for membership in the profession. Or, if the central Government could not assume control of veterinary schools without illegally interfering with State rights, it is proposed that States wherein veterinary schools exist pass laws of co-operation with the National Government to bring about the desired end.

I am one of those who believe that this country is too vast, the varying conditions of separate sections too different, and the requirements of the people of one locality so diverse from those of another, that it would not be policy for the General Government to dictate the management of the schools, besides being an undue interference with the rights of a people who have heretofore been supposed to have the power of thinking for themselves. In the past, paternalism on the part of the General Government has not been advocated in this country, and the passage of a few more pension bills will be quite enough of a drain on the national treasury without any assistance from us, although I am well aware that when one lot of pigs are gathered around the trough it sets all the rest to squealing to get there too.

Nearly all our institutions of learning have been well endowed by the munificence of wealthy people, generally by bequests received after the deaths of the generous individuals, and in this way all the better-known colleges and universities upon this continent have acquired their funds. It should be our aim in the future to do our utmost to interest those who are fond of fine horses and cattle in the subject of veterinary education, with the hope that in time a portion of those interested in the ownership or breeding of valuable live stock may make their donations

to some of our veterinary schools, instead of endowing chairs of Greek or ancient history in classical institutions, or making presents to theological seminaries for the dissemination of knowledge that they never knew anything about or took very little interest in during their lives. At present I am afraid that most of them take veterinary surgeons very much as they find them, without stopping to think whom they have to thank for their existence; very ready to find fault with them for not knowing more, and never stopping to blame themselves for the veterinarian's lack of knowledge. Worse than that, many rich live-stock owners seem to prefer the services of a quack to those of a man who has taken pains to acquire the best education that he can afford.

As to raising the standard of admission and graduation in the veterinary schools as they already exist, I think that is a responsibility that ought to rest chiefly in the hands of our Association. It is an impossibility to have a uniform standard in all the schools in the United States, and even if we did there would be plenty of room for diploma-mills across our northern border, and hordes of ignorant or lazy men ready to attend them, and return as soon as they could possibly obtain a bit of sheepskin, to become the most dangerous and unscrupulous quacks imaginable.

But it should be the feeling of our Association that we advise a higher standard of veterinary training; that a man ought to present substantial evidence of a thorough preliminary education upon entering upon a course of veterinary study, and that we favor at least a three-years' graded period of teaching.

If we show that these are our sentiments in no uncertain or timid manner, the faculties of those colleges who really have the interest and advancement of our profession at heart will speedily show a disposition to meet our requirements. Then we can decide what schools to recognize, and only allow graduates from them to enter our Association. Schools that are run simply to advertise the officials connected therewith, or to act to their pecuniary advantage, will continue to exist, and will continue to have students, but we should not recognize them in any way, and advise young men coming to us for counsel to have nothing to do with them.

At present it is of far greater importance that we advocate a higher standard for matriculation, than that we try to bring about any changes in the present courses of study in the various veterinary schools. Students upon entering should have a thorough English education in any event, and we should do all in our power to encourage graduates of classical and agricultural colleges to enter this profession. Given a young man with a good education, keen perceptions, a well-trained mind and a desire to learn, and start him upon the right track, and he will acquire the knowledge he desires. If, on the other hand, he is unused

to study, is ignorant, so ignorant that he can hardly read and write, much less take notes on lectures or comprehend the information which his instructor is striving to impart, he would never be a thoroughly-educated veterinarian, even if he attended a ten-years' course instead of two winter sessions of five months each. In this latter class of men are those, to quote from my colleague, Dr. Griffin, "who complain that our veterinary journals are too scientific, and who admire the organ that gives them prescriptions and cure-alls in its columns."

First of all, we must insist upon having *educated* men enter our veterinary schools, and it will be time enough when this is accomplished to criticise the curricula and length and number of sessions. It must be borne in mind, also, that to a certain extent at least "veterinary surgeons are like poets, born and not made."

In order to be really great as a veterinarian, a man must combine two rare gifts. First, he must have that peculiar mental organization which enables him to grasp and understand the art and science of medicine, so well exemplified in the late Dr. Austin Flint, which enabled him to stand at the head of the medical profession in this country during his life. Secondly, he must have that intuitive faculty of understanding animals and gaining their confidence—a knack that applies to the horse more than to any other animal, and constitutes the difference between a horseman and one who is not. As the late William Herbert, better known as "Frank Forrester," says in his *Hints to Horse-Keepers*: "To become a perfect judge of a horse requires the observation and attention of half a lifetime; nor with every man will these be sufficient, for a certain degree of natural tact and talent, or adaptability to the study, is clearly indispensable; and there are some men who, if they were born in a manger and brought up in a stable, would never become horsemen or judges of a horse."

Either of these great gifts, to a degree approaching perfection, is very rare in any man. How much rarer, then, must be the two combined in a single individual?

"Frank Forrester's" words make as good an argument as could be advanced in a few sentences against the old-fashioned idea, that prevails more in England than with us, that the prospective veterinary student should serve a period of pupilage with a practitioner or farmer, in order to learn about animals and their management.

Our Secretary, Dr. Hoskins, in a recent article upon "Uniform Veterinary Education," after discussing various means for alleviating existing evils, suggests that it would strengthen our Association, and give it more influence with the veterinary colleges, if legislation could be secured requiring that all candidates for veterinary positions in the Army and in the Bureau of Animal Industry, and similar offices, be

members of our Association. It would also in a measure relieve these places from the "bane to-day of our infamous spoils system."

I will weary you no further with the matter of educational—though one of my co-workers upon the committee advised that our report would be stronger if I devoted it entirely to this subject—as there are two or three other matters upon which I wish to say a few words.

First and foremost among them is the great medical sensation of the year, Koch's remedy for the treatment of tuberculosis, of which so much was expected, and from which only a great harvest of disappointed hopes was gathered. Even after it was found to be a failure as a remedy it still retained great interest to us as veterinarians on account of its possible value as a diagnostic agent in determining doubtful or suspicious cases of tuberculosis among our bovine patients; but here again it proves to be a disappointment, as in some cases of tuberculosis the animal fails to react to the inoculation, and in other instances where the subject shows a marked reaction to the subcutaneous injection of the material, tuberculosis does not exist. A great drawback in arriving at its true value has been the anxiety on the part of many, if not nearly all, of the experimenters in whose hands it has been placed to obtain the results from its use predicted by Koch, rather than to observe its action in a cool, impartial manner, and accept the facts exactly as they are.

Koch's treatment of tuberculosis consisted in the inoculation of a sufferer from the disease with a ptomaine produced by cultivating the *bacillus of tuberculosis* artificially in culture media, and is not an entirely original idea. Salmon and Smith, of the United States Bureau of Animal Industry, have successfully experimented with ptomaines from "hog cholera" cultures as a preventive inoculation for the disease. (See special report on "Hog Cholera," Bureau of Animal Industry, 1889). Professor Rudolph Emmerich has found that in various swine diseases, especially swine erysipelas, if the juices expressed from various tissues or organs of an animal suffering with the disease be rendered sterile and used to inoculate healthy animals, the animals thus inoculated receive immunity if exposed to the disease. (*Münchener medicinische Wochenschrift*, May 12 and 19, 1891.)

This method has the great advantage over Pasteur's inoculations with an attenuated virus of the disease, in that it is immediately available for use in an outbreak, and that animals not already attacked by the malady may be saved, while in Pasteur's preventive inoculations the animals require inoculating with viruses of varying strength before the disease appears among them.

In this country farmers are apt to be careless and feel no anxiety about the danger of a contagious disease until it actually appears among their animals, when it is too late to apply Pasteur's inoculation, but this new method of inoculating with ptomaines might avail.

This means of preventing disease is based upon the theory that the results of infectious diseases are caused quite as much by the poisons produced by the bacteria as by the micro-organisms themselves, and that immunity is due to a changed condition of the cells of the body, caused by these ptomaines, which gives them the power to resist infection again for a period of considerable duration. Now, if we can introduce the ptomaines without the bacteria producing them, we give the animal economy immunity from the action of the disease-producing germs.

Tuberculosis is a peculiar disease. Its tendency is to invade organ after organ, producing irreparable structural changes until death finally comes to the victim's relief, and, although many cases appear to recover when placed under proper hygienic conditions, we do not know whether the disease becomes only latent until conditions become favorable for its development, or whether one attack, if the patient really recovers, gives immunity from another. In fact, one attack of tuberculosis seems to predispose to another. Hence, a means of treatment which may be successful in ordinary infectious diseases, where there is a natural tendency toward recovery, and a restoration of diseased organs to a normal condition, may fail of useful results in such a malady as tuberculosis.

While the study of the application of ptomaines as preventives of infectious diseases is yet in its infancy, we must not forget the great boons conferred upon mankind and animals by Pasteur's methods, chief among which is his anti-rabic inoculation. This is brought home to us with especial force, because we have now established in New York a Pasteur Institute, where the principal work done up to the present time has been the preventive inoculation of persons bitten by rabid dogs or dogs supposed to have been rabid.

The Pasteur Institute of New York, under the charge of Dr. Paul Gibier, with Dr. C. Van Schaick as assistant, and Dr. A. Liautard as consulting veterinarian, was opened for the treatment of persons bitten by rabid animals, February 18, 1890, and during the year ending February 18, 1891, 828 persons presented themselves for treatment. Of these it was demonstrated that in the cases of 643 persons the animals attacking them were not mad, and they were not subjected to treatment.

"In 185 cases the anti-hydrophobic treatment was applied, hydrophobia of the animals which inflicted bites having been evidenced clinically, or by the inoculation in the laboratory, and in many cases by the death of some other persons or animals bitten by the same dogs. No death caused by hydrophobia has been reported among the persons inoculated." (Dr. Gibier's first annual report.) The following is a list by States of those treated :

New York	18	Pennsylvania	5
New Jersey	27	Maryland	3
Massachusetts	16	Missouri	3
Connecticut	11	New Hampshire	2
Illinois	9	Texas	2
Georgia	5	Kentucky	2
North Carolina	5	Ohio	2

One each from Maine, Arizona, Minnesota, Iowa, South Carolina, Nebraska, Rhode Island, Arkansas, Virginia, Louisiana, Indian Territory, and Ontario.

Those who could not afford to pay were treated free of charge.

This is a good showing for its first year's work, and the amount of misery and suffering saved to humanity by Dr. Gibier and his confrères is incalculable, and yet this institution has no endowment fund of any kind, and no outside assistance whatever, and its charity work comes directly out of the pockets of those connected with it. This is not as it should be, and we, as the veterinary body of this country, should assure Dr. Gibier of our sympathy in the great work in which he is engaged, and do all in our power to secure for him the recognition he so richly deserves, and for the Pasteur Institute that pecuniary aid which it stands so much in need of.

One suggestion in our last annual report has already borne fruit in Massachusetts. It was that portion relating to the condition of the United States Army veterinarian. A friend of our profession, to whom I submitted a copy of my report as Chairman of the Committee a year ago, who is a member of the present Legislature, and very much interested in military matters, presented a bill at last winter's session of the Massachusetts Legislature, providing for the appointment of a veterinary surgeon upon the staff of each battalion of cavalry or artillery in the Massachusetts Volunteer Militia, to rank as a 1st Lieutenant; "for," said he, "Massachusetts has taken the lead in a number of military reforms which have afterward been adopted in the regular Army, and this is a chance to bring about a reform in this respect."

The bill became a law, with the result of the appointment of two veterinarians, one to the battalion of artillery connected with the 1st Brigade, M. V. M., the other to the battalion of cavalry connected with the 2d Brigade, M. V. M.—the first two veterinarians, so far as I know, to hold commissions as officers in the United States. Let us hope they will not be the last. Unfortunately the artillery veterinarian is but a second year's student at the Harvard Veterinary School, but I hope that by another year he will be a full-fledged M.D.V. The cavalry veterinarian is your humble servant. It is to be desired that members of our own profession and their friends will continue to work to bring about official recognition of our profession in various ways in the different

States. What progress has been made toward establishing a veterinary department in the United States Army you will doubtless be informed by the committee having this matter in charge.

In concluding this report I believe that the Bureau of Animal Industry should receive a little of our attention. I thought of calling your attention to it a year ago, but my paper then seemed so long that I decided to defer what I had to say until a future occasion, and am now glad that I did so, as it has given me an opportunity to beard the lion in his den, so to speak, which I always prefer to do, if the opportunity permit.

We have connected with the United States Department of Agriculture, the Bureau of Animal Industry. Its chief is a veterinarian, and a large number of his assistants are also veterinarians. It is the only department in which the United States Government officially recognizes the veterinary profession in a manner that at all appeals to our self-respect, and as the great veterinary organization of this country we naturally take much interest in its work and usefulness. We are better able, perhaps, than anyone else to criticise its actions and results, being, as we are, specially educated on the subjects with which it has to deal. We have the same right as the rest of the people to commend the action of our servants, or to find fault with the way in which they conduct their work; besides which, by our special training, we are in a position to feel that we have a peculiar right to show our approval, or our disapproval as the case may be, of the labors of this Bureau.

Of the practical work of the Bureau of Animal Industry I shall have little to say. It has almost eradicated contagious pleuro-pneumonia from this country, and in time will undoubtedly succeed in its complete extinction. For this service alone it deserves the thanks of the people, and has repaid many times over every cent that has ever been appropriated by Congress for its support, including all it has expended in other directions. These results could have been obtained by any good veterinarian possessed of tact and administrative ability. When we come, however, to a consideration of its scientific investigations we cannot say a great deal for its efficiency.

If we review as briefly as possible the work done in the scientific investigations of swine diseases by the Bureau of Animal Industry, it will be quite sufficient to demonstrate to us the value of its bacteriological work and the credence to be placed upon any statements emanating from its officials.

If an exhaustive report were written upon the researches in swine diseases in the United States during the past few years, together with all the controversy that they have brought forth, quite a large volume could be easily filled. A year ago, when I thought of referring to this matter in my report, I should have based what I had to say upon an

article by J. Amory Jeffries, M.D., which appeared in the *Journal of Comparative Medicine and Veterinary Archives*, for December, 1890, entitled "Etiology of Two Outbreaks of Disease Among Hogs." Although my report was written before the article appeared in print, I was fully cognizant of its contents, having assisted Dr. Jeffries with the work, and in fact, did a portion of it myself. Material which I have since been able to avail myself of only confirms me in the views which I then held, without changing them in any important particular.

The other articles of which I speak, and to which I would refer all interested in the matter, as time will only permit of my presenting the conclusions I have drawn from them, are:

"A Contribution to Our Knowledge of the Cause of Swine-plague, and its Relation to Connected Bacteriological Operations," by Dr. P. Frosch (*Zeitschrift für Hygiene*, vol. ix. p. 235), editors, Dr. R. Koch and Dr. C. Flügge.

"Upon Our Knowledge of the American Swine-plague," by Dr. Theobald Smith, Chief of the Bacteriological Laboratory of the Bureau of Animal Industry. (*Zeitschrift für Hygiene*, vol. x. No. 3, p. 480.)

"Reply to the Preceding Work of Dr. Th. Smith, upon 'Our Knowledge of American Swine-plague,'" by Dr. P. Frosch, Assistant in the Institute of Hygiene of the University of Berlin. (*Zeitschrift für Hygiene*, vol. x. No. 3, p. 509.)

Also, at a meeting of the Scottish Metropolitan Veterinary Medical Society, held in Edinburgh, February 25, 1891, Mr. Thomas Bowhill, M.R.C.V.S., read a paper upon "Swine Fever." Vide *Veterinary Journal*, May, 1891. To sum up:

Jeffries concludes that Billings' "swine-plague," and Smith's "hog cholera" germs are identical, and differ from those of the disease he has investigated; and that cultures Smith sent him of his "swine-plague" germ are identical with the disease germs that he (Jeffries) has been studying, which produce a septic pneumonia in swine that they can communicate to calves, and very probably to lambs, sheep, and other animals.

In short, the much-vaunted "swine-plague" is simply a septic disease which is not peculiar to swine by any means. It is caused by one of a large group of bi-polar organisms capable of producing similar symptoms in such small experiment animals as are susceptible to them. Jeffries concludes by saying: "But while only two germs of this class are known to infest hogs in the United States there may be others in Europe, e. g., 'Wild-seuche.'"

I think that Jeffries' work is particularly accurate and very valuable, and am surprised that it has not attracted a great deal of attention, although it does not seem to have done so.

Dr. Frosch, in his first article, compares the work done by Billings

with the work supposed to be Salmon's, and draws the following conclusions:

1. "The bacterium of Salmon's hog cholera and Billings' swine-plague are identical."

2. "The same is the cause of the American swine-plague, while the proof of an etiological relation of the bacterium of Salmon's swine-plague to the first, especially to a second plague of like extent, has not yet been sufficiently demonstrated."

3. "That the bacterium is identical with Selanders's Schweine-pest bacterium" (Selanders's schweine-pest being the swine disease of Sweden and Denmark), "but different from the bacterium of the German Schweine-seuche, chicken cholera, rabbit septicæmia, and ferret plague."

4. "The ferret disease is caused by a separate kind of bacterium, and cannot be grouped with the rest."

Dr. Smith's is a reply to Dr. Frosch's first article.

Dr. Frosch's second paper is a reply to Dr. Smith.

Mr. Bowhill's paper announces that he has found in cases of swine fever, in England, a bacterium identical with Billings' swine-plague germs, and that he has sent specimens to Billings, who confirms his discovery.

Here we have two excellent investigators, one in the United States, and one in Germany, confirming the identity of Billings' swine-plague germ and Salmon's hog cholera germ, and each one acting independently of the other, while the third finds the same germ as the cause of the English swine fever.

Dr. Billings boldly announces that he found his germ of swine-plague in July, 1886, among the first pigs that he examined in Nebraska which had died of the disease.

Salmon, in his report for 1884, discovered a micrococcus as the cause of what he then called swine-plague. In his report the next year he says it is due to an oval, motile bacterium. Later, in some of his replies to his critics, he attributes the discovery of this organism to his assistant, Dr. Th. Smith. Dr. Frosch says: "This circumstance not only readily explains the intrinsic contradiction of the reports for 1884 and 1885, but also seems to have influenced Salmon's further investigations."

In a special report of the Bureau of Animal Industry, upon "Hog Cholera: Its History, Nature, and Treatment," issued in 1889, there is a short history of the investigations of swine diseases made in the United States, but we do not find any mention of the name of Billings, although he discovered at once the bacterium which the Chief of the Bureau of Animal Industry had been searching for years, and which he probably would not have found for some time if he had not had the help of an

assistant whom he was not generous enough to credit with the discovery, and so let it pass as his own.

In the report of the Bureau of Animal Industry for 1886, p. 20, we find the following statement:

"In view of the results of investigations which have shown the existence of two distinct infectious diseases of swine, perhaps of equal virulence and distribution, a change in the nomenclature becomes necessary, in order to avoid any confusion in the future. Since these two diseases have been considered as one in the past, and the name swine-plague and hog cholera have been applied indiscriminately, we prefer to retain both names, with a more restricted meaning, using the name hog cholera for the disease described in the last report as swine-plague, which is produced by a motile bacterium, and applying the name swine-plague to the other disease, the chief seat of which is in the lungs. This change is the more desirable, since recent investigations have shown that the latter disease exists in Germany, where it is called swine-plague (Schweine-seuche)."

The following questions propound themselves to us after reading the above:

After speaking of the disease as swine-plague for several years, did the Chief of the Bureau of Animal Industry call Billings' swine-plague "hog cholera" for the sake of creating confusion? (Thus while apparently ignoring him, at the same time paying him the greatest possible compliment in the power of one man who seems to so admire another.)

If the name "hog cholera" was not used in place of swine-plague for the purpose of creating confusion, why was a septic pneumonia of the pig termed "swine-plague," unless it was for the purpose of causing still further confusion, when, as we have seen, the disease is not confined to swine, but a little careless study would have shown that pigs could easily communicate it to other species of animals? Dr. Frosch pays the methods of bacteriological study pursued in the laboratory of the Bureau of Animal Industry the deservedly high compliment of doubting any "etiological relation of the bacterium of Salmon's 'swine-plague' to the pest, especially to a second plague of like extent."

But Jeffries' work removes all doubt upon this matter, and we know that the Bureau of Animal Industry has found another disease of swine, which is a septic pneumonia, and is not alone confined to swine, and which for some reason or other they choose to term "swine-plague." Furthermore, it is not impossible that one animal may be infected with both maladies simultaneously.

The so-called swine-plague of the Bureau of Animal Industry is one of those septic diseases due to filth, and is seen chiefly where putrefying city swill is fed, and farmers around Boston find that if the swill is boiled and then fed before there is time for the putrefactive process to

commence again, they are not troubled with it. In this respect it resembles closely the German Schweine-seuche. If this be a true swine-plague, make the most of it.

Dr. Smith's article is, as I have said, in reply to Dr. Frosch's first article. In it he attempts to uphold the work done under the auspices of the Bureau of Animal Industry and to throw discredit upon the work done in Nebraska, and also to answer the criticisms in Dr. Frosch's first article.

Dr. Frosch's reply to Dr. Smith has its chief interest in his closing sentences. After briefly answering Dr. Smith's remarks, and saying that there is no need of his defending Dr. Billings, as he is abundantly able to defend himself, Frosch ends with: "From the present publication of Smith, however, which could not be seen in reading the reports of the Bureau of Animal Industry, it is evident that Salmon was not the discoverer of either the 'hog cholera' germ or that of the 'swine-plague,' so now we know the condition of things in that regard."

Whether Frosch's feelings of admiration for the honesty and generosity of the pseudo-scientist whose work he supposed he was reviewing when he wrote his first article were equal to his feelings of pity and contempt for the assistant, who was obliged to give the credit for his hard work to his chief or lose his official head, and yet serve as a pillar for his doughty chief to hide behind in case of an attack, I leave to your imagination.

You will see that Jeffries in his paper gives Smith the credit for the the work he has done. It has been no secret to me for the last year and a half as to who was actually conducting these investigations in the Bureau of Animal Industry. Having taken the investigation of swine diseases as a fair sample of this Bureau's scientific labors, are we to be expected to place any dependence upon the accuracy of the statements emanating from its officers concerning such work, especially when they conflict with the results obtained by men like Paquin and Billings, unless the work of the former is confirmed by experiments conducted by independent and unprejudiced observers of recognized ability?

How can we as a profession feel anything but disgraced when we think of the opinions which must be held in Koch's laboratory, the greatest bacteriological laboratory in the world, concerning our Bureau of Animal Industry and its scientific work?

I do not wish anyone to think that I have taken up the cudgels in Dr. Billings' behalf. Scientific research is the search after truth, and work that is recognized as good abroad cannot be ignored at home, no matter what the personal feelings of one man may happen to be toward another. No one deploras more than I the personalities that so often pervade the writings of the investigator employed by the State of Nebraska, that have done so much to detract from the dignity of his work,

which I believe to be really correct and valuable, and it must be borne in mind that blackguardism does not add to the weight of argument. On the other hand, a lack of honesty and straightforwardness is equally bad or worse, and modern political methods are not to be tolerated in the conducting of scientific researches.

The former style of writing shows what it is on the face of it. The latter often hides a good deal beneath its surface. One is like the rattle-snake, which gives warning when it is about to strike. The other is more dangerous, like the deadly moccasin, which strikes its fangs into its victim without giving any indication of its presence.

If the Bureau of Animal Industry is to be a political organization, why not have its chief simply write the letter of transmittal of his annual report to the Secretary of Agriculture, and have a few true scientists in its employ to work unhampered, and make their own reports upon the questions that they have been studying upon. This, at least, for the sake of making a more creditable appearance to other civilized nations, if we have no respect for ourselves.

More could easily be added of adverse criticism upon the management of the Bureau of Animal Industry, but enough has been said for the present, and it does not seem advisable to continue this report to too great length.

In conclusion, I wish to heartily express my thanks to my confrères upon this committee for the valuable assistance they have rendered me in obtaining material for this report.

AUSTIN PETERS, M.R.C.V.S.,
Chairman.

DISCUSSION.

The PRESIDENT: I would suggest, in order to expedite and facilitate and make the discussion of these reports more clear, and to avoid the annoying conversation which we sometimes have—short questions being answered, and perhaps useless questions being asked at times—that each member be allowed a time not exceeding ten minutes for a single discussion. Of course, if anything is to be added of special nature, the privilege can be accorded.

Dr. CLEMENT: Mr. President and Gentlemen—I was very much pleased to hear the report of my friend Dr. Peters this morning, and I must say that I am very much impressed with the fearlessness with which he expresses his opinion. I think we should all follow his example at our meetings. I wish to speak only for a moment upon that part of his report which refers to investigations of swine fever and hog cholera.

I wish to say a few words simply because it has been my opportunity for the last three or four years of doing some work in that line myself in association with Prof. Welch, at the Johns Hopkins University. I might say, in parenthesis, that my work in this line has nothing whatever to do with my position as Government Inspector; that it is independent work performed in the laboratory of the above institution. The conclusions which we have arrived at, expressed in a few words, are these, and I must be careful in mentioning them that I do not anticipate what is to come out in the report next winter, namely: That there are two diseases of swine in this country. First, there is hog cholera, and secondly, swine-plague. That the two diseases which occur in hogs of this country are described in the reports of Dr. Smith, of the Bureau of Animal Industry; that the organism described by Dr. Billings as swine-plague and that described by Dr. Salmon as hog cholera are identical. That swine-plague does exist and does cause more or less trouble, is, in our opinion, without a doubt. As to what connection the organism has with the lesions described in the reports of the Bureau is a question on which we might not all agree. Nevertheless the swine-plague organism does cause trouble. The trouble in hogs is as a rule, in our experience, one of mixed infection. We have not had the opportunity of seeing an outbreak of swine-plague pure and simple. The remarks which Dr. Peters quotes from Dr. Jeffries' experiments, to me seem not altogether in keeping with the work which is being done at present.

The conclusions which Dr. Jeffries draws are that there is but one disease of hogs. According to the investigations made at that time, we have found it is very hard to say, when swine-plague is present, that hog cholera is absent, from the fact that swine-plague kills in a few hours, while hog cholera requires some days. If, then, an animal be killed and presents lesions of the intestines such as are generally supposed to be characteristic of hog cholera, the statement must be very carefully considered before it is made that hog cholera is not present. We were thrown off our track once or twice during the earlier part of our investigation. We found afterward that hog cholera did exist in these animals that we thought had swine-plague pure and simple. We found that some of the colonies were different from others, and required cultivation and inoculation into animals, and produced cholera even if the inoculation from the sick to the well animal, and the characteristics of hog cholera absent, kill the animal. I would simply say in a general way that from our investigations we have found that Dr. Billings is right in certain other matters.

As to the identity of the American swine-plague with the German swine-plague, I am not at liberty to speak at this moment, on account of the absence of my senior associate in the work. I cannot say too much, either, as I said before, because the report will be forthcoming in the course of a

few months at most, and I think it will then be found as fair a report as the investigators in the matter are capable of producing, and as said above, that all the parties interested in this long-continued discussion are right in certain directions.

Dr. KILBORNE: I wish to answer one point in Dr. Peters' remarks this morning, and that is in regard to the credit due for the investigations of hog cholera. It is insinuated in that report that whereas Dr. Salmon has been receiving the credit for the work that has been done, it turns out now that Dr. Smith has been doing that work all along. That, in one sense, is true, but I have been connected with the Bureau for the last five years in its work, and the investigations in swine disease until the past year have been under the immediate supervision and direction of Dr. Salmon himself. The microscopic work is in charge of Dr. Smith, and the field experiments I have had charge of. If anyone will take the trouble to read the report of the Bureau of Animal Industry they will find in every one of the reports that it is distinctly stated in the preface or letter of transmittal that Dr. Smith has had charge of the laboratory and I have had charge of the experiment station. Anyone who will look at that can easily conclude the assistants who had done the work, and I do not see how they can accuse the Chief of the Bureau of playing double in that matter. The work has been directed by him, the experiments were directed by him, and he has reported the result.

Dr. CLEMENT: Can we speak twice on the same question?

The PRESIDENT: There is no objection.

Dr. CLEMENT: I wish to quote a short paragraph from Dr. Jeffries' article in *The Journal of Comparative Medicine and Veterinary Archives*, December, 1890:

"One dead, full-grown hog was sent to me for bacteriological examination. Unfortunately decomposition was well under way before it came to hand. Autopsy, made by Dr. Peters and myself, shows skin red and blue in patches and studded with ecchymoses, especially on the ventral surface. Lungs dark red to purple, resistant, but not so solid as in lobar pneumonia; cut surface moist, bloody fluid, with bubbles oozing out on pressure; bloody pleural and pericardial effusions; pleurae, pericardium, and peritoneum cloudy and studded with small hemorrhages; spleen enlarged, emphysematous, putrid; liver congested; kidneys with hemorrhagic blebs up to the size of a small beech-nut scattered over the surface; intestines much decomposed, so that the presence of ulcerations cannot be affirmed."

Even there he admits the possibility of the so-called ulcerations of the intestines, which is the generally accepted characteristic lesion of hog cholera, and which, in my opinion is diagnostic of hog cholera. In a second animal he admits the presence of ulcerations in the intestines, but at the same time says in conclusion, "The two epidemics studied by

me were due to a small bi-polar germ identical with sample of swine-plague received from Washington, and culture of Löffler's germ from Schütz, per Billings. No hog cholera or swine-plague bacilli occurred. No characteristic lesions have been observed the pathology pointing to a general infection tending to chiefly affect the lungs and intestines." It seems to me very evident that these animals were affected beyond all possibility of a doubt with hog cholera as well as with swine-plague, which the author of this volume claims was the sole cause of death. I do not think he could prove that hog cholera was not present, unless he examined carefully the several colonies in Esmarch tubes or plate-cultures from each organ, in that way demonstrating the absence of the cholera germ.

I simply say this, not as against the work here quoted, because it is such a very good contribution, but as simply showing the difficulty surrounding the investigation of these complicated diseases of the swine. It is by no means an easy task as demonstrated by the literature upon the subject.

The SECRETARY: Mr. President, I do not care to switch off from the hog subject, but Dr. Peters this morning, in his admirable report, touched upon the standards of the various veterinary schools in this country. I think, as to the suggestions outlined, that this body, being the leading body, should demand for its membership the highest and broadest curriculum and the highest and broadest qualifications of individual members—that this is no longer a question for us to decide. I think the multiplication of our membership as rapidly as it is multiplying is the best evidence of it, and the question is as to whether we are as an Association leading the profession in this country. It looks rather that we are willing to follow whatever school or organization may lead. Certainly we are all imbued with the fact that no one can be trained in the breadth and scope of veterinary medicine and veterinary science in less than a three years' course of six months each, devoted entirely to the subject of veterinary science and no collateral branches.

Therefore it becomes prudent at this moment for this Association—not through her Comitia Minora, which has seen the failure of members for years—but it is better that this Association as a body shall take steps at this meeting to make that training a compulsory part of the qualification of the future members of this Association, and perhaps in no year further away than 1892 for us to adopt it. The multiplication of schools and veterinary chairs in agricultural colleges is fraught with the greatest dangers to the veterinary profession in America, and perhaps has retarded us more and kept us in the position we occupy in the veterinary world, more than any other one thing. This Association should no longer look to what should be the qualification of a member in a State or local association; but, high and above all, should place its own

qualifications, regardless of any other organization, on the plane that Dr. Peters has pointed out so clearly. I should like to see a resolution incorporating a suggestion that a three years' course, of not less than six months each, shall be devoted entirely to the study of veterinary science and be one of the necessary qualifications for admission to this association in 1892.

Dr. McLEAN: The Comitia Minora were almost a unanimous body for the recommendation for adoption by this Association of the very features that have been so carefully laid before it by Dr. Peters in his report. To carry that into effect it would be necessary at the same time to give notice of an alteration of your by-laws. The by-laws call for certain requirements, and those provisions would have to be annulled in order to put in force the suggestion which has been thrown out by Dr. Peters and Dr. Hoskins. As I said before the Comitia Minora, it might possibly be thought advisable to accept in lieu of one course of six months the certificate of a year's pupilage under a practitioner of our profession. In many schools theory is carried to an extreme point where the practical is very much neglected.

Theory and practice must go hand-in-hand, and we know that in many cases practical knowledge is only obtained at the expense of the owner of the patient after the pupil has left the school.

Dr. MICHENER: I do not think we are likely to come to any agreement on the subject. There are certainly a few among our veterinary schools, which, while they claim their willingness to make the course three years, have no idea of doing so. I doubt if they ever will do it, notwithstanding their expressions of willingness, and I think we had better be careful in introducing anything of this kind in our constitution. I scarcely believe that any of those now operating under a two-years' course will change it. They say they will do it, but they do not do it. What I think really ought to be done in this matter, and I think our constitution allows it, is to examine any applicant whether he be a graduate or not, before we elect him as a member of this Association. Examine him, no matter from what college he may come, so that we may be sure his requirements meet our ideas of what they should be. I urge upon the society the necessity of doing this. We could thus get men who would do us some credit. We should insist in all instances on an examination. Some schools with a three-years' course turn out men who are less fit to practise the veterinary profession than some colleges having only a two years' course. Two years, of course, is too brief a period to study a profession like this. We are, or should be, studying the profession as long as we live. We only achieve in the short time devoted to the college course the right to possess a diploma. It is after that that we get the real knowledge we possess. I would urge that in future these examinations be insisted upon in a vast

majority, if not in all cases, rather than change the constitution and by-laws.

Dr. LYFORD: We have worked along with little results from the colleges. It is high time that we take another step, and I think that we can take this in advance of the colleges, and they certainly need some prompters. We have asked them various questions, and they evade the answers. They tell us that they will do certain things, as Mr. Michener said, and they never come to time. The large proportion of those having a two-years' course admit that they would be glad to make the course three years. If we can in any way compel or stimulate and induce them to make a three-years' course, we have started in advance in a way that will promote the quickest results. It is hardly expected that the professors of the different colleges will get together and agree upon a course, and I think if they see that the standard required by the profession and the U. S. Veterinary Medical Association is a three-years' course, it will not be long until those now requiring a two years' course, or a practical course of one year and six months or less, will soon make a three years' course necessary. It is not the college, it is the brains that go into the schools. It is the men that make the students, and if we get good students from a two-years' course college, it is very poor judgment to think that the same good students would not excel in a three-years' course college. I do not think Mr. Michener considers that the same student in two years can equal the student for a three-years' course, and I think it is a poor argument to advise the continuing of the two-years' course if we can in any way remedy it and induce or promote the three-years' course principle, and prevail upon the different colleges to come to that standard.

There is another thing. The curricula of some of these colleges do not require the same amount of studies as others. I think the Comitia Minora will also play a part in this result. When it is brought up, I think we ought to make it strong enough to cover the ground for agricultural schools and compel them to take an active part as those making a profession of it.

Dr. WINCHESTER: Several years ago there was a by-law that members should pass an examination in order to become members of this Association, if they did not possess a diploma of some school. That sounds first-rate. I had the misfortune to be by proxy at one time an examiner of some gentlemen who were proposed for membership. That examination was a farce. It was over in less time than it takes to tell about it, and the parties were duly accepted as honored members of this body, which undoubtedly they have proved themselves to be by their actions. Now, in order to make an examination necessary for admission to this Society and have it straight, and have your examiners chosen from this Society, if it is any sort of an examination it will take a week

at least, and how many members are there here who will give up one week's practice and come and sit in a hall and keep those fellows from niggling to pass their examination to become members of this Association.

The SECRETARY: We had at Chicago some ninety applications for membership, and we did not get through until after two o'clock in the afternoon, and instead of convening at ten in the morning we did not meet until half-past two in the afternoon. The question of an extended course of instruction of three years of not less than six months each is to guard against the establishment of a Veterinary chair, in which a Veterinary department is in connection with the agricultural school. They all have their course of three years of six, eight, or nine months each, and at the same time two-thirds of that period is applied to branches that do not directly pertain to veterinary science, and the entire course of instruction, as has been well said by Dr. Peters this morning, is invariably the result of one man's work, perhaps assisted by two or three of his own production. Surely that is not right, and surely a man coming simply with a diploma of that type should not be considered qualified to be a member of the United States Veterinary Medical Association.

Dr. McLEAN: I would like Dr. Michener to understand that in the remarks I make I do not pretend that the United States Veterinary Association is legislating for the colleges, but simply establishing a standpoint to be strictly carried out as to the qualifications necessary to be a member of our Association. Let the colleges follow or let them stay out.

Dr. CLEMENT: It seems to me that an institution having but two or three professors in a special line may possibly be as good as an institution which turns out men in one very short session, where the principle is that it makes no matter who comes in, and it is only a question of numbers, and not quality. It seems to me that the one-man institution is certainly as desirable as the short-course institution. But I am quite in accord with his remarks if a resolution should be passed stipulating the length of a course and the number of professors. If the length of course be stipulated so should be the number of teachers. It seems to me we are going a little beyond our limit. This is a cosmopolitan Association, and the question is whether it does not represent the Association as it stands, not as we wish or think it ought to be.

Dr. MARTINET: Does not this discussion pertain more to the report of Dr. Lyford? It does not pertain to Dr. Peters's paper.

The PRESIDENT: Is there any further discussion on Dr. Peters's report? Otherwise Dr. Peters has the floor in response.

Dr. PETERS: All I will say about my paper is, that I considered everything I had to say very carefully before I said it, and there is nothing in it but what will hold water, and nothing that I will take back.

to time a veterinary examining board, which shall consist of the chief veterinarian and two veterinarians of the United States Army Veterinary division, to examine candidates for the position of assistant veterinarians with the rank of second lieutenant and for promotion in the division.

SEC. 6. That promotion below the rank of field officer shall be by seniority; but no officer of the division shall be entitled to promotion thereby until he shall have been examined and approved by a veterinary examining board; and if any such officer fail on examination he shall be suspended from promotion for one year, when he shall be re-examined before a like board, and in case of failure on such re-examination he shall be discharged from the service.

SEC. 7. That officers of the Veterinary division shall not be eligible for promotion other than in that division.

SEC. 8. That any of the present veterinary surgeons who shall fail to pass the examination required by section two of this Act shall be discharged with one year's pay.

On or about the 20th of December, 1890, I received a second letter from Dr. Lemay, dated at Pine Ridge Agency, South Dakota, December 13, 1890, which I herewith annex:

PINE RIDGE AGENCY, S. D., *via* RUSHVILLE, NEBRASKA,
December 13, 1890.

DR. W. B. E. MILLER, Camden, N. J.

DEAR DOCTOR: Your letter of November 29th I received some time ago; many thanks. After several trials I finally succeeded in seeing Senator P. B. Plumb, and, though the Senator is in favor of increasing the efficiency of our branch of the service, I discovered he was opposed to giving us commissions, giving as his reasons that the army was already top-heavy, and that by so doing the duties would be performed by the subordinates, as is the case (in his opinion) in all other branches of the services. He, however, requested that I send him a communication showing the deficiencies in the present system, with the reasons and advantages of proposed corps, all of which I promised to do at my first opportunity, but shortly after was ordered in the field with my regiment, and of course had not the opportunity.

Immediately on my return home shall comply with Senator Plumb's request.

Have made several attempts to meet Senator Ingalls, but always failed. I have found it a very difficult matter to see these gentlemen; they are constantly on the go, and rarely home more than a day at a time. The only and sure place to find them is in Washington.

Do not hesitate to call on me for whatever assistance you may require.

By the way, I wish to state that I am not in favor of the bill now pending. Its salaries of \$1000 and \$1200 are not as favorable to us as our present salaries of \$900 and \$1200, with the privileges and allowances of light, fuel, and quarters, which are not considered in present bill. The amount of salary in present bill must be scratched off and mounted rank of 1st and 2d lieut. substituted instead.

Very respectfully yours, DANIEL LEMAY.

P. S.—For some reason or other I understand that Senator Plumb is not friendly to the army. Writing in camp is a difficult labor.

LEMAY.

About this time I visited Washington City in person, and went before the Committee on Military Affairs, and endeavored to resurrect the bill, which had been in their hands since the previous session of Congress. The holiday season was then approaching, and some of the members of the committee had gone to their homes for their usual vacation. Many other members of Congress not on the committee had gone also, and I was obliged to defer further action until such time as they would again reassemble after their holiday season was over. Until this time I was also ignorant as to who the other member of the committee associated with me was, and I therefore wrote your honorable Secretary, Dr. Hoskins, for the desired information, and on the 22d of January, 1891, I received from him the following letter:

PHILADELPHIA, PA., January 21, 1891.

DR. W. B. E. MILLER.

MY DEAR DOCTOR: The names of your associates on the Army Legislation Committee are as follows: Dr. Daniel Lemay, Fort Leavenworth, Kansas; Dr. Cooper Curtice, Department of Agriculture, Washington, D. C.

Very truly yours, W. HORACE HOSKINS,
Secretary.

I at once wrote Dr. Cooper Curtice, and requested him to give the matter his immediate attention and render such assistance as was in his power to further the passage of the bill. I received from him a personal letter in a very few days thereafter, in which he stated that owing to his official duties at the Department of Agriculture, he could not possibly give the matter any thought, much less personal attention. He also expressed himself as not being very favorable to the bill at all.

About this date I also received a letter from Dr. C. D. McMurdo, offering his assistance in this work, as follows:

FORT SILL, O. T., January 17, 1891.

DR. W. B. E. MILLER, 532 Penn St., Camden, N. J.

DEAR DOCTOR: Will you kindly inform me how the bill for Army Veterinary Service is progressing, as I am much interested in it. As

the sons of Senator Gray and Senator Butler are personal friends of mine, I asked them to write to their fathers and get their support to the bill, which has been done. I also wrote to Senator Warner, who is a great friend of mine, and he wrote to what influential friends he had in Washington and asked their help for our bill. If there is anything else I can do, please let me know. Yours truly,

C. D. MCMURDO,
Jun. Vet. Surgeon 7th Cavalry.

I then made a second visit to Washington in person, and through the influence of the member of Congress from my own district I obtained an audience with the Committee on Military Affairs. From them I learned that there was a very strong opposition to the bill in its present form, and, alas! a general opposition on the part of some of the members of Congress to the passage of any bill that would create more offices and increase the number of commissioned officers. I also discovered the fact that some of the medical officers of the Army were opposing the bill, on what ground I could not ascertain, except that they were fearful that the dignity of the medical profession, as demonstrated by themselves, might, in their opinion, be somewhat lowered by having veterinarians placed upon an equal footing with themselves.

In conversation with many members of Congress I found a disposition on their part to favor the bill and give it their assistance should it ever come up in proper form. Toward the close of the session of Congress I made a third and final visit to Washington, and again endeavored to have the interest in the bill revived. At this visit I discovered another opposition to the passage of the bill now pending, said opposition having its origin among the veterinarians already employed in the army, and which has assumed such proportions as to be quite a formidable barrier to the passage of a measure that does not meet their demands.

At this visit I decided that it was useless to further try to pass any bill at this time, and gave the matter no further attention. In proof of the above statement the following letters received within the past month bear positive testimony:

HEADQUARTERS EIGHTH CAVALRY,
FORT MEADE, S. D., August 22, 1891.

DR. MILLER, Camden, N. J.

DEAR SIR: As Chairman of the C. A. Legislation, I venture respectfully to submit a copy of a section, which, if added to the proposed bill, would, in my opinion, be the means of the withdrawal of the entire opposition which the past attempts at army veterinary legislation encountered. It did not seem compatible with humanity or justice to attempt to have discharged from the service those who had spent the best part of their lives therein, nor is there any precedent for such con-

templated action, as the War Department so far, in all its changes, has always recognized the vested rights of its old and faithful servants. I submitted this matter to those who attempted legislation last Congress, but it was not entertained, and as a result the bill failed to get through the upper house. If we are provided for I am willing to subscribe any reasonable amount to any fund for legislative purposes.

Respectfully,

M. J. TREACY,
Veterinarian 8th Cavalry.

SECTION.—That all veterinarians employed as such in the U. S. Army shall have three months' leave, with full pay, previous to being examined; that their examination shall be confined to practical professional subjects only, and they will be examined previous to other candidates. Should they fail to pass the required examination they shall be discharged with one year's pay. *Provided*, That in cases of physical disability, they will be retired, with 75 per cent. of their pay and allowances.

MILES CITY, September 10, 1891.

DR. MILLER, Camden, N. J.

DEAR DOCTOR: I am impelled, by a knowledge of your sense of justice toward non-graduates, to address you a letter concerning army veterinary legislation, on which subject, I have learned, you are about to draft another bill. As I have had much experience with the army, being appointed in 1877, and having almost continuously kept before the authorities the benefits derived from veterinary science, etc., suggestions from me may not be amiss. All the time I have been in the army I have been treated and respected as a gentleman, and have little to complain of except a provision for old age or disability. Rank and promotion are, of course, desirable and necessary to provide for the former.

Former bills have been antagonistic to non-graduates, inasmuch as they either ignored them or put them in competition with recent graduates for positions now held by them. Now, the non-graduates in the army are men of long service and experience, having given thorough satisfaction to the authorities, *vide* accompanying testimonials.

I personally have to plead guilty to advancing years and a large, helpless family, without funds, for I always held myself the equal of army officers socially, etc. (I regret I cannot say as much for many of our graduates). I may tell you, on account of the mentioned reasons (and you won't blame me), I have bitterly opposed the passage of former bills. I have many friends in the War Department and the United States Senate, and have in my possession letters from nearly every Senator indicating that they would not allow injustice done to us.

As I am favorably known in Washington, I believe I can assist future legislation, if it should be generously disposed toward the non-graduates

(only three) in the army. I would therefore suggest that a clause be inserted in your next bill that veterinarians of over ten years' service be retained without examination at lowest rank, the service being accepted as an indication of their fitness, and that they be retired at three-fourths of their pay and allowances should they be physically or otherwise unfit for further duty. This would give us an opportunity of retiring from the way of future aspirants for army veterinary honors.

I would further suggest: to be modest as a start, not particularly so as to rank, *but as to number*, for the great objection is the increase of *the commissioned list*.

If you will be kind enough to send me a copy of the drafted bill, and if reasonable to non-graduates it will have my untiring efforts to its passage. Trusting your pardon for so much encroachment upon your time,

I am yours truly,

R. B. CORCORAN,
Sen. Vet. 8th Cavalry.

LONDON, PICCADILLY, September 5, 1889.

Having had the pleasure of inspecting the last batch of remount horses purchased for the United States troops at Fort Keogh, and brought thither from the State of Washington by Army Veterinary Surgeon Corcoran during the months of May, June, and July last, I have no hesitation in saying that they are, in my opinion, superior as cavalry horses to any provided for the British Army. I have, in conversation, expressed the same sentiment more than once to the head of the Army Remount Department in London (Gen. Ravenhill) with regard to other similar Western American horses bought under the direction of Mr. Corcoran for the 1st United States Cavalry, and I have only to add that I venture to give the above opinion on the strength of nineteen years' service in Her Majesty's Army (much of it on the staff), and of several years' experience in Western America while engaged in horse-breeding on a large scale. My only object in writing this is to place on record a fact which I am prepared to maintain to the army authorities of either country.

[Signed]

E. PENVELL ELMHIRST,
Captain.

[A true copy.]

M. C. MUSTIN,
First Lieut. and Adj't. 22d Inf.

In consideration of all the difficulties in the way of passing the bill now pending I would recommend that the bill be so amended as to meet the requirements and petitions set forth by those who have been army surgeons for years, or at least in such a way that it will be satisfactory to them, or that a new bill be drafted which can be supported by the opponents of the present bill; and that this Society, through its

President and Secretary, issue a circular letter, to be sent to each and every member of this Association, requesting and urging upon them the necessity of using their own personal influence with the members of Congress in their own or adjoining districts to give their aid and votes to the passage of said bill at the next session of Congress.

A committee of three is too small to perform all the work necessary to carry a matter of so much importance; and as in union there is strength, so with the assistance of many outside the committee that may be appointed to prosecute the work during the next year, can have stronger hopes for the successful performance of their arduous duties.

Respectfully submitted,

WM. B. E. MILLER, D.V.S.,
Camden, N. J.

DISCUSSION.

Dr. MILLER: I might say a word in relation to the work that I was not able to state in the report. As I just stated to Dr. Michener, in the three visits I made to Washington I worked diligently upon the subject. I also corresponded with almost every Senator and member of Congress whose name and address I could obtain; I wish to say, also, that you have no idea of the amount of labor and time that is necessary to bulldoze—as you might term it—a bill of that kind through Congress in the face of the objections that have been urged against its passage, and some of them very plausible ones. Some of these objections are in letters received from men who have been in the service ten or a dozen years. It does seem pretty hard, even if they are not graduates, after they have given their time and services, that they should be summarily dropped. If they have been capable of serving the Government all this time, and the Government has received their services, it seems rather a hardship that they should be thrown aside and others put in their places. All they ask is very reasonable. As written in their letters, they asked that they be retired with certain pay. That is one cause of dissatisfaction that we would not have to contend with if it were taken out of the proposed bill. It is hard to put a bill through Congress that is so unfavorable in the eyes of members as this bill is.

As I stated in my report, there is a decided objection on the part of Congress to increasing the commissioned officers of the army. They say that the army is too large already, and as these men have done the work heretofore, and the Government has gotten along very well with them, they do not see the necessity of passing the bill. That is one of the points brought against it, and when you appear before the Military

Committee they have such powerful arguments against the increase of commissioned officers that they make you feel at sea.

I did all in my power to increase the veterinary force of the cavalry service. Members of Congress say that they are cutting down the number of medical officers of the army. I think, however, if the amendments I recommend are made to the old bill, that with the united effort of veterinarians with their Congressmen at home, we can go to the next Congress and get the bill through without very much legislative work, and it was for that reason I made the recommendations referred to. After having gone all over the ground and given the matter careful thought, I believe, from conversations that I have had with members of Congress, we could push the matter through.

The PRESIDENT: I was sorry, while in the chair, not to see anyone take up this question of army legislation, because I think it is a very important subject, not only to the community but to ourselves, to this Association, and to the standard of the veterinary profession. I have had a good deal of experience, having been chairman of that committee for the year preceding the last year, and am thoroughly cognizant with the difficulties which Dr. Miller has mentioned to you, and which I did not mention in my report a year ago as chairman of that committee, for the reason that, at that time, the bill was in such a position I did not care to use names personally, but which I will do now without hesitation.

It is certainly an outrage that the animals of the United States Army are the only animals in the world that have not authorized official veterinary protection. Even the Government of Guatemala, a small republic, has a Veterinary Corps to look after the animals belonging to the government. There is not a civilized government but our own that does not employ a Veterinary Corps. You know the position that a veterinarian occupies in our army to-day. It was a bone of contention a year or two ago. I could give you the case of a veterinarian who was sent by the Quartermaster's department of the army to the West. The letter is on file in the Surgeon-General's office to-day, and I have read it. He was in St. Louis five months under pay, reported to the Quartermaster's department daily, and he did actually nothing. He was sent into Kentucky to report to a Board for the purchase of horses, where the *Inspector*, who had a great deal of personal ability, looked over and bought a number of horses. The veterinarian was a thoroughly competent man and former member of this Association, now dead. He was not allowed to express an opinion on the animals purchased. They were sent to one of the cavalry companies, and five of the horses the captain refused to accept as not fit for the purpose for which they were purchased.

The men employed in the army are, some of them, members of this Association, and there are some decent, reputable men among them that we are glad to have. There are others that you would not employ in

your infirmity, and it is among that class that we meet the greatest opposition in the matter of legislation. It is these particular individuals whom officers in the army do not want to receive a commission. I knew all this a year ago, but did not mention it. If those individuals who happen to hear my remarks wish to apply them to themselves, all the correspondence is at the disposal of the Association. There are about 150 letters from these men to myself and to each other, and letters that have passed two or three hands with indorsements before they reached me, on file, and if parties wish to apply to themselves what I am saying they can have the benefit of reading the letters.

Now that is the position of the opposition. It does not apply to these men as a class, but to individuals among them, and it is from that little group that the principal opposition comes. It is going to be slow work for the reasons Dr. Miller has given you. There is a large number of commissioned officers in our army compared with other armies, and the disposition of Congress at present is to reduce the number. If we suddenly had a war it would be very easy to get a veterinary service and have it put upon a good standard. If war was declared suddenly the Government would probably give us fair rank ; but we hope, of course, that there will not be such an event as war. In the meantime we hope to attain our aims, and can only work toward them slowly. If it never got beyond the Military Committee, every Congress we should have a bill pending that we think we can have passed and get it indorsed by the head of the army. Certainly a committee should be kept in this Association that will always be acting on the matter of army legislation and be in a position to take advantage of the first opportunity of establishing a proper service.

PUBLICATION COMMITTEE.

MR. PRESIDENT AND FELLOW MEMBERS: As Chairman of your Publication Committee I would briefly report that through the work of our stenographer at Chicago we are enabled for the first time in our history to have a complete report of our transactions. This entire matter has been placed at your command during the year through the kind courtesies of the *American Veterinary Review* and *Journal of Comparative Medicine and Veterinary Archives*. The good these journals have done for us cannot be properly estimated at this writing, and their generosity should receive our just recognition. The magnificent work of the *American Veterinary Review* in its special number, containing in entirety the whole work of our meeting of 1890, the most memorable in the Association's history, will prove a valuable record on our library shelves for years to come. It seems to me that some such plan as the "Review special" should be yearly adopted hereafter, as it seems unfair to ask so much space of our veterinary publications, and especially so when appears simultaneously the same matter in corresponding numbers of our journals. The Publication Committee of the future might well consider the advisability of this suggestion, and thus leave to the work of our literary representatives the proper criticism and deductions of our work that shall lead our efforts to higher and better results.

I want to acknowledge here with profound appreciation the generous gift of the editor of the *Review* in favoring the Association with some three hundred and fifty copies of its special edition. A large part of this number has been sent forth to those who were not members of our organization and to other journals and bodies that would be led to an interest in our work as fellow veterinarians and as citizens of various communities where we felt a need of stronger recognition and support.

During the year five hundred copies of list of officers, committees and members were printed, and a copy sent to each member. The remainder were used in calling attention to our existence among members of the profession who should be numbered among our workers. Others were sent to various commercial sources, from which emanate articles of commerce of interest and use to us in our profession, that you all might be kept posted on the entrance into use of new veterinary literary pro-

ductions, new remedies, new inventions, and instruments, all of which I trust would aid and facilitate your daily routine of duties.

Much miscellaneous matter has been put forth by your committee, consisting of blank applications, blanks for signatures to constitution and by-laws, blanks for notifying members elect, etc., all of which materially aid to a methodical manner for the transaction of our work.

W. HORACE HOSKINS,
Chairman.

COMMITTEE ON NATIONAL AND INTERNATIONAL MEAT INSPECTION.

SANITARY science in its entirety is one of the broadest, noblest, and most ancient of all sciences. From the earliest ages much of the noblest thought, the deepest study, the most sympathetic and earnest endeavors have been designed either directly or indirectly to guard or improve the health of man.

The engineer who effectually drains a malaria-breeding swamp; the architect who constructs a house with due regard to light and air, and free from disease-breeding drains or refuse-receptacles; the trained agriculturist or horticulturist who detects and destroys unhealthy vegetable food; the veterinarian who controls or extirpates diseases of animals which by contact or through the use of the meat or milk are fraught with danger to the health or life of man; the physician who applies scientific measures to control or extirpate disease in man; and the great masses in close connection with these and many other human labors, all work upon a common ground, for a common purpose—human health and life—striving to vouchsafe to man his biblical threescore and ten years with a healthful body and mind.

It is sometimes asserted that this or that profession is the most important of all, but each is vital, and it is as difficult to measure or compare their value as it is to fix a price on human health or life.

Our ever-changing social, political, and geographical environments lead us to view with equally inconstant eyes the rôle of each of the useful sciences in relation to mankind. The one which proves most attractive under certain conditions commands generally the greatest number of, and most zealous workers, while equally vital subjects are progressing but slowly or lying wholly dormant until the favored branches have been enthusiastically advanced to a point far beyond that attained by the other correlative sciences, until the harmony of the whole is destroyed and the aims of the more advanced sciences are hampered or their progress impeded by the tardiness or deficiency of such branches as may from one cause or another have been suffered to fall far behind. At such times it becomes necessary to find sufficient earnest and competent workers to revive and advance the lagging member and bring it into line with other useful sciences.

During the whole period of human history probably no other vital science has been allowed to drop so far behind its associates, nor suffer

so seriously from a long and baneful dormancy as the inspection and control of the flesh and milk of animals intended for human food, until at last the urgent necessity of the situation has forced itself upon the attention of the civilized world, and the demand has gone forth for zealous and efficient workers in the much-neglected field, in so effective a manner that already much worthy and highly honorable labor is being done, by a rapidly and ever-increasing band of earnest investigators, until we now have abundant promise that meat and milk inspection will soon occupy a highly honorable place in the front rank of the sciences holding a vital relation to human life, health, and happiness.

Meat inspection is almost as old as human history, and has been fundamentally influenced by religious, social, political, and commercial usages. The early Jews enacted meat inspection laws upon an unusually high sanitary plane and enforced them under the sanction of religion and with all the rigidity and zeal of a sacred religious rite. The Jewish meat inspection ordinances apparently rest upon the Mosaic law, and now, centuries after the tables of stone have vanished from the sight of man, these meat inspection laws still seem as indelibly stamped on the mind of the orthodox Jew as they were during the days of Moses, and the civilized world looks with reverence upon the ancient customs and heartily wishes that essentially the same laws could be adopted universally and administered as faithfully and effectually as they were thirty centuries ago.

The necessity for meat inspection is so apparent and well known to intelligent people that your committee scarcely feel warranted in dwelling even briefly upon this phase of the question. Recent study in connection with the so-called contagious and infectious diseases has demonstrated apparently beyond all chance of doubt that they are each due solely to special living organisms. The contagious diseases of men and animals are in many cases identical and intercommunicable, either by contact or by ingestion of parts of the diseased body by the healthy animal, and it is now a well-recognized fact, unqualifiedly indorsed by all who are versed in either human or veterinary medicine, that the ingestion of diseased meat and milk is the direct cause of much disease and death in the human family. The practically universal use of meat and milk as human food in all civilized countries renders the question of their freedom from disease of pressing import to the health of the nation.

Meat inspection possesses great importance also in relation to national economy, as it affords the best and most available means for the prompt detection of the existence of contagious diseases among animals, indicates the location and extent of the infected area, and enables the Government to institute elaborate study into their nature and causes and the influence of climate, soil, and other environments upon them, and to promptly apply remedies for their control or eradication.

In our opinion meat and milk inspection should be carried out primarily in the interests of the intended consumers of the food products, and not, as is too often the case, in the interests of the producer.

It should constantly be remembered, however, that the unwarranted condemnation of healthful animal food or that which could economically be rendered sanitary, is a waste of food resources which no nation should tolerate, since by this waste the price of meat is advanced proportionately, and thus rendered less and less available as a food to those who stand in greatest need of it—the poorer laboring classes.

The early Jewish meat inspection was carried out with especial reference to Jewish consumers, and strictly forbade the use of the flesh of diseased animals as food for their own nation, although it would appear from the Mosaic law that such diseased flesh could be sold to other nations, if they desired to buy. The meat inspection partook of the character of a religious rite, founded, doubtless, on sanitary reasons well known to the Jewish priests. The religious phase of this inspection was probably highly essential to effectiveness, since religious reverence and awe constitute the main source of power in ecclesiastical governments. If an animal was condemned on account of tuberculosis, the greed of the owner could in no way be so effectually controlled and silenced as by the invocation of ecclesiastical law. At the same time, under the tribal relations of the Jews, he could probably evade the use of a part of the diseased animal for his own food, only with difficulty.

Among the great mass of the human family, where religious sentiment fails to enter into the question of human food, the consumer has slaughtered and inspected the animals intended for use as food in his own family or has relied upon the knowledge and sterling honesty of his butcher.

Recent social, political, and commercial changes have seemed to separate farther and farther the consumer of meat from the producer, and a knowledge of its fitness for food becomes more and more difficult to obtain, until under our present environments the meat we obtain at a butcher's stall might appropriately be termed a mystery. An Eastern capitalist, who is in nowise learned in regard to the diseases of cattle, owns a ranch some three thousand miles distant in a Western territory, which he visits at intervals of several years, and leaves the sale of cattle to irresponsible men who neither know nor care whether they be healthy or not, and from his hands they are shipped two thousand miles to a great slaughter-house, where the cattle are bought for the express purpose of slaughtering to sell again, and thence the meat is sold to a wholesale meat dealer in some distant city, or perhaps several thousand miles away in some foreign country, then resold again to a retail butcher who finally disposes of it to the consumer. Until within the past few months this process has taken place in this country under the solitary

eye of the interested seller, solely from a mercenary standpoint, and leaving the consumer in the most absolute ignorance possible as to the source and sanitary condition of his meat supply. The meat consumers had thus reached the climax of ignorance as to their meat supply, and had attained the pinnacle of danger to which a people can be subjected through the use of diseased meats.

Other countries have in some cases quite old-established meat and milk inspection laws, and under the goadings of national enthusiasm and love of country it has been reported that certain of the more highly civilized European nations have ample inspection laws, which are effectually administered by a thoroughly trained and organized corps of inspectors.

In the matter of government meat inspection, Germany claims, and perhaps justly, priority in point of effectiveness; but if we are to judge the work by its fruits in the prevention of the transmission of diseases from animals to man, or by the evidence adduced by the highest German authorities themselves, they yet fall far short of an ample law effectively administered. If this can be said of Germany, still more may be asserted of other nations.

The prime obstacle to effective meat and milk inspection has ever been, and will continue to be, the irrepressible and unavoidable conflict between the mercenary interests of the seller and the sanitary interests of the consumer, and upon a scientific and practical adjustment of these interests must meat inspection rest if it is to succeed.

In essentially all respects the interests of the producer and consumer are identical under a judicious meat inspection, and it is rather due to unscientific and irrational laws and actions that these interests are usually brought into violent conflict. Nutritious meat, which is wholesome, or which can be readily rendered healthful, is as much, nay more, of a loss to the poor laborer than to the wealthy stock-breeder or meat-dealer, for while each carcass excluded from the market serves to increase the profits on those remaining to the seller, they invariably render the procuring of a suitable quantity and quality of meat more difficult for the poor.

Bollinger has well observed: "Were statistics available as to how many persons have died from insufficient nutrition, especially from the want of sufficient nutritive meat, we would find a much larger percentage than from the use of the flesh of diseased animals for food." We are thus reminded by this very eminent authority that we should, for humane and national economic reasons, be exceedingly careful to not exclude meats which are or can readily be rendered highly suitable for human food.

We have already stated that meat inspection should be made primarily in the interests of the proposed consumers of such meats. When a Jewish

rabbi, either personally or through a duly authorized party, inspected the meat for a particular tribe or clan, and carefully guarded the interests, from a sanitary standpoint, of his own tribe and kinsfolk, his work was accomplished, and the matter concerned only the immediate tribe. Civilization, with the centralization of power, and breaking up of small tribes or clans, and the organization in their stead of vast kingdoms, empires, and republics, with the great commercial changes, has rendered the ancient Jewish law, in some of its phases, inapplicable to our present needs. In our country, with our meat-producing animals reared at one point, killed at a distant slaughtering centre, and then distributed to every part of the Union, the nation becomes the consumer of meat, and so national meat inspection becomes a necessity. The people of the United States cannot consume the entire meat product of the nation, but have a vast surplus, which it is desirable should be sold into foreign countries, where, from the density of population or other unfavorable environments, there cannot be sufficient meat produced to supply the necessities of its people. In such event, if we would conform to the proposition that meat inspection should be primarily in the interests of the consumer, it is evident that, if we are to enjoy a large meat export trade, the inspection of such food products must be so conducted as to properly guard the health and lives of those by whom the meat is to be used. To this end opportunity must be given to the importing countries to know that the inspection is skilfully and conscientiously performed.

It is possible that other than sanitary reasons may lead a State or nation to exclude from its markets the food products of another. We recently witnessed the ineffectual attempts of certain States to exclude dressed meats imported from others by laws apparently inspired by the desire of the affected States to protect their cattle-raisers; and the assertion of Bollinger that, to his mind, more persons die from the want of a due amount of meat than from the eating of diseased meat, would indicate that some of the great meat-importing countries of Europe base their exclusion of foreign meats upon political rather than sanitary causes.

Your committee, appointed largely for the purpose of continuing the study and discussion of Dr. Schwartzkopff's paper on "National and International Meat Inspection," read before this Association at its last meeting, find it impracticable to review every part of his production at length. We will pass over his remarks as to how meat inspection should be carried out, merely stating that we are in full accord with the author and believe with him that meat inspection should be only undertaken under just and sufficient laws, in conveniently arranged public abattoirs, and by qualified veterinarians, fully competent to measure the significance of pathological lesions, with which, in the course of their

duties, they will meet, and that the inspection should be carried out by such persons and in a manner to properly guard the health and command the confidence of the intended consumers.

It has been quite a common custom in many countries requiring meat inspection to confide that trust to some political hanger-on whose qualifications rest solely upon political services rendered or promised in the future. It is evident, however, to any intelligent person that this duty should be performed by a person well versed in pathology, for, as Bollinger has well observed, "Meat inspection in its highest sense is applied pathological anatomy."

The recently enacted United States Meat Inspection Laws appear to be, in most respects, adequate and beneficent, and although it is as yet too early to speak of their execution, it is safe to predict that with experience and organization our meat inspection service will prove eminently satisfactory so far as our laws extend.

The law apparently has some imperfections which might be remedied with benefit. The provision in Section 7 of the Act, which allows "farmers" a peculiar exemption from the general provisions of the inspection regulations and permits them to slaughter diseased animals, and transport the meat into other States, and sell it for human food, apparently nullifies, to a very dangerous extent, the beneficent provisions elsewhere found in the Act, and offers inducements to the favored farmer to retain his diseased animals on his farm until slaughtered and the more apparent evidences of disease are annihilated before offering it for sale.

The failure, perhaps incompetency, of this law to provide for the destruction of diseased meats, and barely excluding them from foreign or inter-state commerce, tends strongly to vitiate and deteriorate the *intra-state* or local meat supply. In effect, the United States meat inspection law throws back upon the State any animal which may be unfit for human food, and unless the States maintain rigid meat inspection laws (and most of them do not) this provision renders our local meat supply worse instead of better, and benefits only the foreign or extra-state consumer. The Mosaic laws interdicted the use of diseased meat by the Jews themselves, but permitted them to sell it to aliens, while our national meat inspection law reverses this order and forces diseased meats upon the local markets.

These provisions will doubtless lead to the enactment of other laws adapted to relieve local meat consumers from this danger.

The mode of inspection is a question upon which most sanitarians readily agree. There are certain diseases of animals which admittedly render their meat unfit for human food, and which being readily recognizable during the life of the animal, warrants the inspector in condemning and killing the animal and destroying the carcass. Other animals

require a post-mortem examination in order to verify a diagnosis or to discover diseases not discernible during life.

The principal question, the vital one in meat inspection, is, what meat shall be excluded from use as human food? The recent meat inspection law of the United States merely excludes the meat of diseased animals without enumeration or classification, and without dictating what use shall be made of the affected animals or their meat or food products.

Dr. Schwartzkopff, in his previously mentioned paper read before this Association, attempted a classification, which, to the mind of your chairman, seems quite arbitrary, impracticable, and open to considerable criticism.

He divides the whole category of diseased animals into three classes:

1. Diseases in which animals should be condemned, killed, and the carcasses effectually destroyed, viz., anthrax, rabies, septicæmia, cattle plague, glanders, smallpox in sheep, swine-plague and hog cholera, and unborn animals.

2. Diseases in which slaughter may be permitted to ascertain whether the whole or part of the meat is fit for human food, or to be used for industrial purposes, or to be destroyed, viz., foot and mouth disease, tuberculosis, actinomycosis bovis, icterus, milk fever in cows, hydrothorax, and ascites, all diseases which are combined with high fever, general emaciation and debility; for instance, pneumonia, enteritis, uteritis, etc., and over-heated and too young animals, which should be kept for further examination.

3. Diseases only ascertainable after slaughter, and in most cases by the use of the microscope.

Under this head he enumerates the entozoa known to affect meat-producing animals, and one bacteriological disease—actinomycosis suis. How the essayist managed to draw his lines in such a manner is not understood by your chairman.

It is not clear to us why, under his first class—diseases in which animals should be condemned, killed, and the carcasses effectually destroyed—he should place glanders, which in many cases cannot be diagnosed except post-mortem, nor hog cholera, which in the chronic stage may in some cases closely simulate trichinosis, nor can we discover his authority for denominating an unborn animal “diseased” and condemning it to death and destruction.

Again, in his second class he would permit the slaughter of animals affected with tuberculosis, a disease admittedly transmissible to man, and might allow its meat to be sold as food, while under his first class he would exclude swine-plague and hog cholera, which are certainly not transmissible. Again, he places septicæmia in his first class and destroys the carcass, while uteritis—which is septicæmia beginning in the uterus—he would place in the second class, and perhaps allow it to be used as

human food. He would kill a cow with milk fever in order to ascertain the suitability of the carcass for human food, when we cannot see what new guide for action would be revealed post-mortem. Under his third class, without stating or suggesting the line of action to be followed as to the use of the meat, he places actinomycosis suis, while all other bacteriological diseases, even actinomycosis bovis, are placed in the other two classes.

It seems to your chairman that veterinary science is at present sufficiently developed to admit of and to demand a scientific classification of diseased or unhealthy meats, which, without enumerating all diseases of animals, would serve as a guide in the inspection of meat.

We would not attempt a classification upon the basis of the time at which the disease could be detected and determined upon, but would say that all animals intended for slaughter should first be inspected alive, and if there is sufficient evidence of disease to plainly warrant condemnation, the inspection evidently need go no farther, while in case such evidence is wanting, then permit slaughter and complete the inspection by the necessary post-mortem examination. We would attempt a classification based upon the source or rather the kind of danger which the diseased meat bears for man.

By such a scheme we would have four classes:

A. Parasites of meat, most of which are capable of partial or complete development in the human body.

B. Non-transmissible diseases with variations of temperature, emaciation, or other grave pathological lesions, and diseases due to micro-organisms or in the course of which micro-organisms develop, which do not find suitable media for growth in the human body, and which, therefore, can only act injuriously upon the human body through their excretions or productions or chemical poison due to their presence.

C. Diseases produced by micro-organisms capable of multiplication and growth within the human body and which also produce chemical poisons which when consumed may produce toxic effects.

D. Bacteriological diseases transmissible to man, in which there is no danger from the ingested bacteriological products, but entirely from the living micro-organisms themselves.

We need not enumerate the individual diseases under this method of arrangement.

Under Class A we have a long list of parasitic diseases, which, in meats offered for sale, are mostly found in a natural state, or matured to the highest point possible in the host, *e. g.*, encysted trichinæ, larval forms of *teniæ*, etc., rarely affect the general condition of the body of the host, and can only injuriously affect the consumer by the ingestion of the living parasite. In such cases thorough cooking of the meat under

official control renders it safe and only objectionable from a sentimental standpoint.

More rarely it happens that some of these parasites, by invading vital organs, may cause a general derangement of the system which by producing grave pathological conditions, fever, emaciation, anasarca, etc., as is seen in larval forms of tape-worm in the brain; in strongyli of the lungs and bronchi in cattle and sheep, strongyli of the arteries in the horse, distoma hepaticum of cattle, or by wholesale migration to every part of the body, as in the first stages of trichinosis.

In all such cases the entire carcass—and in those where the parasites, although in a passive state, are yet so abundant as to be abhorrent, all infected parts of the carcasses—should be not only condemned but rendered innocuous under official supervision, since the condemnation of some kinds of parasitic meat, and allowing it to be consumed raw by dogs or other lower animals, renders the extermination of such diseases impossible and not infrequently only gives the parasite opportunity to undergo one more stage of development, and return to man in a far more dangerous form than that found in the condemned meat.

Consequently, provision should be made for the complete destruction of these animal parasites before the condemned meat passes from official control.

Under Class B we place the flesh of animals diseased from a malady not transmissible to man, but which may contain chemical substances, ptomaines or other organic substances which when ingested may produce serious constitutional disturbances. Included in this class we find a large number of sporadic affections accompanied by variations in temperature, nutrition, etc., of a more or less grave character, as in ordinary pneumonitis, pleuritis, enteritis, etc. It includes also a long list of contagious diseases of animals, among which we find the most destructive epizootics, exerting in most cases great influence on our national economy. Among these are contagious pleuro-pneumonia, hog cholera, and closely allied diseases, Texas fever, and many similar affections. We believe it to be generally conceded that in all this class the flesh of such animals is only rendered dangerous as human food when the disease-processes have attained such a stage as to produce a decided variation of the body temperature, marked emaciation, or other grave pathological conditions; in which cases the meat should be absolutely condemned as human food, and only permitted to be used for industrial purposes after the carcass had been rendered innocuous (in case of contagious disease) to the lower animals.

Class C might with profit be divided into two rather distinct subclasses:

1st. A group of what we might term "sporadic" infectious diseases, such as pneumonia, pyothorax, pyæmia, septicæmia, uteritis, septic

enteritis, pyo-sephthæmia or omphalo-phlebitis of newborn animals, recent infected wounds, etc.

This includes one of the most important classes of diseased meats in the entire category, although from their nature they are of comparatively little concern to our subject proper—national and international meat and food inspection—because they are ordinarily slaughtered for local use. Bollinger has well observed that of all authenticated cases of death from the consumption of diseased meats, that 80 per cent. were due to the use of flesh from “nothgeschlachteten thieren,” or animals slaughtered when death from other causes was imminent, in order to avoid financial loss to the owner. These animals slaughtered under urgent necessity belong almost, if not wholly, in this subdivision, or rather they constitute it.

In our second sub-class we include the epizootic contagious diseases of animals which are transmissible to man, and which also produce within the animal body ptomaines or other chemical products of a dangerous toxic nature—rabies, anthrax, acute and constitutional glanders, tuberculosis, and actinomycosis.

The entire carcass of animals coming within this class should evidently be destroyed completely, both for sanitary and economic reasons.

Under Class D we would place three closely allied affections which constitute the most stubbornly contested field in veterinary and medical sanitary science, having engaged the attention of sanitarians for years, and promising yet much controversy ere the questions are settled. Upon this class your committee has found it impossible to agree.

This class includes, in our present state of knowledge, three diseases, or rather a form of three of the maladies enumerated under the second sub-class of Class C.

They are the chronic local, or perhaps more properly, latent form of glanders, tuberculosis, and actinomycosis. They have many characters in common, so much so that we have been enabled only recently to differentiate them. Actinomycosis was long known in one form as glanders in cattle, in other forms as tubercular stomatitis and tubercular enlargement of glands, while in man actinomycosis was known as a variety of tubercular affection. All are peculiarly widely disseminated over the world, and in many cases exceedingly latent or passive, often discernible only by post-mortem inspection, may exist in certain individuals for an almost indefinite time without inducing noticeable constitutional disturbances; they all have a predilection for the lungs and lymphatic glands, gain their admission to the animal economy and effect their extension largely through these. The micro-organisms are highly gregarious in their habits, and have a great tendency to become encysted in various sized cysts with fibrous and fibro-calcareous walls. This encystment renders the inclosed micro-organisms passive, or rather, in

many cases, they retrograde and even perish; and thus in all cases, through this encysting process, a large portion of the bacilli, sometimes, so far as we can discern, all of them, become so encysted and render the affection wholly latent, and later these bacilli may largely or wholly perish, and recovery of the animal follows, and in two if not all three diseases with immunity from future attacks.

All are transmissible to a wide variety of animals, and the micro-organisms thrive in vegetable media. In a healthy animal the digestive processes are usually fatal to the etiological movement.

The transmissibility of glanders to man and the dangerous character of glanders-affected meat for human food is, we believe, universally conceded.

The contagious character of tuberculosis among the lower animals has been well attested in every possible respect. 1st. By clinical observation. 2d. By experimental transmission. 3d. By the production of immunity from subsequent exposure. Its identity in the various lower animals and in man rests upon as thoroughly tested a basis as is recognized in medicine, and the inter-transmissibility between man and animals has been equally well established. Space forbids that we should consider the question of the fitness of meat of mildly affected tuberculous animals for human food beyond the general conclusions as to the entire class.

The third affection in this class, actinomycosis, constitutes, at present, the most stubbornly contested ground in the whole question of meat inspection from a sanitary standpoint, and it has been found impossible for your committee to agree. Consequently your chairman has felt compelled to present his personal views in the body of the report, and has asked Prof. Schwartzkopff to give as completely as possible the contrary phase.

The fundamental point upon which rests the classification herein proposed is the question of the contagiousness of actinomycosis. What constitutes a contagious disease? Based upon the derivation of the word and the knowledge of the class of diseases to which it has been applied, it has been held to signify a malady transmissible by contact or approach.

Later developments in medical knowledge have gradually led us to apply this word in a more restricted sense, excluding internal and external animal parasites, and meaning more particularly those highly contagious affections due to the invasion of vegetable micro-organisms.

We would then say that in the present light of medical science, when speaking of contagious diseases in a restricted sense, that we apply the term to those affections due to the invasion by a micro-organism of a more highly organized body, wherein the invading organism finds all the conditions and environments essential to its growth and reproduction, and in which the newly generated organisms are capable of attaining the same

degree of development and maturity as the initial invading entity, and hence becomes capable of transplantation to other analogous organisms. In other words, if glanders bacilli are introduced into the living tissues of a soliped not previously rendered immune, and they multiply, and the new organisms attain the same development as that possessed by the bacilli constituting the initial inoculation, then these new bacilli must be equally capable of transplantation with the old, and hence, under the present meaning of contagion, glanders is contagious.

During the discussion of Prof. Schwartzkopff's paper on meat inspection he says: "As to the question of actinomycosis, as I said before, theoretically, it is not contagious. . . . I do not believe it is contagious, and I base my opinion on my own experience as well as my theoretical studies in handling cattle in the Berlin slaughter-houses.¹ The basis for Prof. Schwartzkopff's conclusions seem, to your chairman, somewhat vague.

We fail to comprehend how, in ordinary routine work in a Berlin slaughter-house, a disease can be classified as contagious or non-contagious. He has not given us any data from his theoretical or practical knowledge of the disease which throws the least light or reason upon his conclusions.

Your chairman, in unison with most veterinarians throughout the world, believes it is contagious, and we predicate our belief upon the following facts, which will probably be admitted by Prof. Schwartzkopff.

1st. Bacteriologists, so far as we can learn, universally agree that the micro-organism found in actinomycosis in lungs, lymphatics, liver, bowels, muscles, etc., of lower animals and man are all identical with the reproduction of the actinomyces found upon various forms of vegetable food; that in these groups of actinomyces in the affected animal body are to be found micro-organisms identical in morphology, maturity, vitality, and reproductive power with the actinomyces found on plants.

2d. It is universally agreed that actinomycosis is due to the invasion of and multiplication in the animal body of these actinomyces or ray fungi. Under the definition we have proposed for *contagion* these two factors render this disease contagious.

3d. It is generally, if not universally, admitted that actinomycosis originates in animals through the lodgment and multiplication of actinomyces in wounds or abrasions of the skin or mucous membranes—probably in some cases by the inhalation and lodgment of the fungi in the air-cells. This fact rests upon abundant and authentic clinical records.

Observations of the disease in man, where the history is traceable, make it evident in every case that the disease was due to infection

¹ Am. Vet. Rev., vol. xiv. p. 495.

through external wounds. Dr. Bodamer¹ relates a case in a miner where the infection was evidently due to the introduction of actinomyces into a wound. Dr. Schimer² records a case in man referable to wound infection, and also Ponfick.³

Other recorded cases in man are strongly suggestive of inoculation during mastication of actinomyces containing food by means of abrasions of the gums and about the teeth. Compare cases recorded by Dr. Murphy: *N. Y. Medical Journal*, 1885, p. 17; Dr. Conover: *Journal of American Medical Association*, 1885, p. 608; Israel, in *Virchow's Archiv*, vol. lxxiv.; Ponfick: *Die Aktinomykose des Menschen*, Berlin, 1882; Rosenbach; *Centralblatt für Chirurgie*, 1880.

Were the history of inception of actinomycosis of the internal organs of man available, they, too, would doubtless exhibit distinct evidence of inoculation through a wound, abraded or extremely delicate membrane, after ingestion or inhalation of actinomyces.

Clinical observations of veterinarians in connection with the origin of actinomycosis in animals indicate clearly and beyond contradiction that the disease is due to the translation of the ray fungus from some other organism to a wounded, abraded, or extremely delicate surface.

Once the micro-organisms have invaded a wound and have found suitable ground for their growth and multiplication, it is admitted by all scientists that new crops, without known limit as to number, generate, mature, and perish, while the disease spreads and augments, or sometimes declines in varying degrees.

These propositions are admitted, so far as is known to your chairman, by all scientists, whether they believe the disease contagious or non-contagious.

4th. Experimentation, the crucial test as to the transmissibility of a disease, fully bears out the above facts. John⁴ transmitted the disease by inoculation in 75 per cent. of trials with fresh material from a diseased animal.

Ponfick⁵ likewise succeeded readily in transmitting the disease in cattle by intravenous and subcutaneous injections, but failed to transmit it by feeding the fungus to cattle, and had negative results in inoculation in dogs and rabbits. Bodamer⁶ records six successful operations out of thirteen trials with dogs, cats, and rabbits—animals apparently only slightly susceptible.

¹ *Journal of Comparative Medicine and Surgery*, vol. x. p. 182-199.

² *Chicago Medical Journal and Exchange*, vol. v. p. 359.

³ *Aktinomykose des Menschen*, Berlin, 1882.

⁴ John: *Aktinomykose*, Bericht über d. Veterinarwesen im Königreich Sachsen, 1881.

⁵ Ponfick: *Die Aktinomykose des Menschen, eine neue infections-krankheit*, Berlin, 1882.

⁶ *Journal of Comparative Medicine and Surgery*, vol. x. p. 120.

Israel¹ and Kotter succeeded in inoculating rabbits with actinomyces from man, while Cruikshank² had a similar result from inoculating cattle with the fungus from an affected man.

Clinical observations lend strong support to the theory of transmissibility of the disease from animal to animal. Casewell³ reports an extensive outbreak of actinomycosis in cattle and hogs, bearing strong evidence of indirect transmission from animal to animal by means of food soiled with discharges from actinomycotic abscesses of an affected animal. Your chairman has observed similar instances where 50 to 75 per cent. of a cattle herd was found affected, apparently due in a great measure to transmission in this way from animal to animal. In company with Casewell and other veterinarians,⁴ we saw an extensive outbreak in the distillery cattle sheds of Peoria, Illinois, in 1889, where inter-transmission apparently played a very important rôle. The extension of the disease seemed due to the fact that badly affected animals were kept in the shed with the healthy, large abscesses about the throat and jaws, being irritated and abraded by contact with high mangers, discharged large quantities of actinomyces containing pus into the troughs along which flowed the slops to neighboring cattle, and the inoculation of the healthy cattle was favored by their being supplied with very coarse, hard wild hay, which evidently served to abrade the mouth and pharynx.

A long list of the leading scientists of the day might be quoted, who believe in the contagiousness of actinomycosis, such as Bollinger, Ponfick, Johne, Friedberger, Frohner, Rosenbach, Bizzozzerro, Lindqvist, Heller, Peroncito, Ochsner, Cruikshank, Fleming, Liautard, Law, and others almost without number. In fact, it seems, so far as your chairman has been able to learn, that contributors alike to standard and current veterinary literature of a recent date all are agreed that the affection is contagious. We understand that Prof. Schwartzkopff and other dissenters have given voice to their theories and deductions through the columns of the agricultural or live-stock press, and avoid placing their views in form or place where they would come within proper range of scientific criticism. We trust that now, for once, Prof. Schwartzkopff and his colleagues will present their non-contagious theory of actinomycosis before this convention from a scientific standpoint, and permit their arguments to be weighed upon a strictly scientific as well as practical basis. We desire that Prof. Schwartzkopff should fully explain his statement at our last meeting, that he predicated his belief of the non-

¹ Centralblatt f. Bacteriologie u. Parasitenkunde, 1888, B. lii. No. 14.

² Annual Report of the Agricultural Department, England, 1888.

³ Annual Report of the State Board of Live Stock Commissioners, Illinois, 1890.

⁴ Special Report of the State Board of Live Stock Commissioners, Illinois (Actinomycosis in Cattle), 1890.

contagiousness of actinomycosis on his theoretical studies and his practical work in the great abattoirs of Berlin. What great veterinarians of Berlin taught our fellow-committeeman that actinomycosis was non-contagious, while such Germans as Johnne, Ponfick, Rosenbach, Friedberger, and such veterinarians of the great Berlin Thierartzlichen Hochschule as Frohner unitedly, and without fear or apology, denominate the disease as infectious? What facts has he learned in the slaughter-houses of Berlin that demonstrate the non-transmissibility of the disease?

Granting the transmissibility of actinomycosis, and thus supporting the above classification, we are prepared to consider the three members of the group jointly in their relation to meat and food inspection. The use of the flesh of solipeds has not gained sufficient popular sanction in this country to warrant us in consuming your time in referring to glanders.

Admitting the identity of human tuberculosis and actinomycosis with these two diseases in the lower animals, and the proof of their transmissibility, the question which confronts us is, What, if any, parts of affected animals are safe for human food or can readily be made innocuous?

Upon this question there is a great variation of opinion, rendering any definite conclusions which would be acceptable to all extremely difficult, if not impossible.

We have taken the stand that in these chronic or passive forms of disease the sole danger to the consumer of the meat or milk of affected animals exists in the living, virile micro-organisms. So we are at once brought to inquire in what parts of the animal body do the germs exist and in what parts are they absent.

Many contend that only those parts which are evidently affected should be condemned and destroyed. This is apparently the idea of Dr. Schwartzkopff in relation to tuberculosis in his remarks on his paper of last year, but a careful study of his utterance leaves one in doubt as to his real belief.

The warrant for the custom of condemning and destroying parts evidently affected with one of these maladies, and allowing the remainder of the carcass to be used for human food, must rest upon one of two propositions: First, that the micro-organisms exist only in those parts where their existence is plainly evidenced by the agglomerations, or, second, upon the theory that meat from a diseased animal must be considered innocuous until the presence of the infecting element in the part in question has been fully demonstrated.

It must be admitted with regard to the first position, that these germs may exist in agglomerations in parts of the animal not usually seen by the inspector, *e. g.*, meningeal tuberculosis. There is further very good evidence that the germs of these maladies are transmitted from part to

part along the natural course in the lymphatics. This is very nicely shown clinically in actinomycosis in man and cattle. In the latter the origin of actinomycotic abscesses in the lymphatic glands in the region of the throat can frequently be clearly traced post-mortem to an initial inoculation in the pharynx, which has merely left sufficient trace of invasion to demonstrate the rôle which this part has played as the point of inception of a disease which is to find a suitable field for development only after the etiological moment has traversed for a comparatively great distance through the channel of a small vessel. We observe this lymphatic transmission most beautifully in actinomycosis of cattle, beginning at or near one of the feet, and slowly but steadily moving along the course of the lymphatic vessels, destroying by suppuration the glands, some of the germs even succeeding in passing these sentries ere their destruction prevents further progress, and continue their ravages toward the central portions of the body. Evidently the actinomyces are usually some distance in advance of microscopical pathological changes, and we cannot judge to what extent a part is invaded except by an utterly impracticable and laborious microscopical examination, with but little warrant of reliability.

The migration of tubercle bacilli and actinomyces through the blood-vessels seems to have been proven beyond reasonable doubt.

It is true that with but a few years' study of these diseases we have recorded but few evident cases of such transmission, but we feel that they quite suffice to overcome negative testimony, although possibly far more voluminous.

Friedberger and Frohner¹ say that it seems possible that actinomycosis can be disseminated by means of the blood, while in case of tuberculosis² they assert that it may and does extend in diverse ways. First, by the lymph channels; second, by continuity or contiguity; third, by the blood circulation. This blood infection and extension happens by the rupture into bloodvessels of tubercular nodules or tubercular affection of the vessel walls. It is well shown when the bacilli are excreted in the milk from an apparently healthy udder. Hamburger³ cites a case of actinomycosis in a colt one and one-half years old, contracted presumably during decubitus through wounds produced by splints applied to correct rhachitic deformity of the legs, in which in bones and cartilage, and finally in the arteries themselves, were found actinomyces.

We are forced to conclude, therefore, that once an animal is affected in a local or passive form with one of this group, that we have no reliable means at our command for determining that apparently healthy parts are in reality sound.

¹ Pathol. u. Therap. d. Hausthiere, Bd. ii. S. 545.

² Ibid., S. 505.

³ Holl Zeitschrift f. Thierheilkunde, etc., Bd. xvi. Lf. 2, 3.

We believe further that it is the duty of the meat inspector rather to be able to say if meat is *fit* for use as food than *unfit*. Where question is raised as to the fitness of given food we hold that the consumer should be granted the benefit of the doubt, and that the inspector should be able to say unreservedly that the meat is wholesome before he permits it, upon his sanction, to be sold for human food.

The recently enacted United States meat inspection laws are as precise, with all their brevity, as can well be devised. It makes simply and only two classes of meat—that from well and that from diseased animals. The former is passed as wholesome, the latter rejected.

This is the true, safe line, and affords between the flesh of animals dead from disease (which all civilized people abhor as food) and that of healthy animals a neutral ground, which should act as an effective barrier to the use, through the greed of sellers, of this repulsive and dangerous food which with our present laws is yet rendered possible in our local markets.

The meat of animals slaughtered at a time when death from disease is imminent cannot be considered preferable to those which have died from the ailment. What possible difference can it make from a sanitary standpoint if a cow with parturient apoplexy is slaughtered or allowed to die from the disease one half hour later?

The neutral ground—disease—between health and death is one which the meat inspector should enter with caution, and so we do not hesitate to assert our belief, predicated upon the foregoing reasons, that the meat of diseased animals of this group should not, under ordinary conditions, be passed as wholesome food.

As we suggested at the outset, however, we are equally firm in our belief that from the standpoint of humanity and national economy we have no right to destroy wantonly and uselessly such an enormous food supply as the unqualified destruction of these meats would entail. Since the whole danger in the consumption of these meats rests upon the presence, or possible presence within the parts used as food, of living, transplantable micro-organisms, it is evident that any process to which it can be subjected without destroying the nutritive value, and yet effectually and beyond all doubt destroy the micro-organism, will render the flesh *sound* from a strictly sanitary standpoint. Consequently, we would say that the apparently healthy parts of such diseased animals should be thoroughly and effectively cooked (boiled) under official supervision, and then passed as sound meat, while the evidently affected parts should be destroyed.

Such a course evidently renders these meats equally as safe as that of the healthiest animal, or perhaps even more so, for we cannot at all times discern what insidious disease be lurking unseen in an apparently healthy body.

We have refrained from dwelling on all the phases of the subject of meat inspection, as suggested in Dr. Schwartzkopff's excellent paper of a year ago, because time would not permit, but have confined our consideration mainly to those questions which seemed to us most in dispute, and which would, in our belief, lead to the most spirited and profitable discussion.

Respectfully submitted,

W. L. WILLIAMS,
Chairman.

DISCUSSION.

The SECRETARY: Inasmuch as there seems to be an absence of those who have been paying special attention to the subject of that report, it would be well to receive the report, tender a vote of thanks to the committee, discharge the committee, and allow the matter to lay over for discussion in 1892. In the meantime we shall have an opportunity of reading and studying the matter, and then certainly we would be better able to understand the discussion that might take place between those who have made this work a subject of study.

SECRETARY'S REPORT.

MR. PRESIDENT AND GENTLEMEN: The past year has been a very busy one in Association circles, and I trust that much of the work done may be found here to-day in the evidence of numbers and interest shown in this meeting. Hundreds of letters of inquiry have poured into my office, and at the close of my work on Monday morning not one remained unanswered or unrecognized. We gather together to-day with a new element among us in the delegates from no less than ten States and local associations, while our members are numbered among the most active in every Association circle in the land. Our Association numbers to-day 270 members actively participating in our work, and in addition we have the support and encouragement of some seven on the roll of Honorary Membership; while to-day some thirty more have knocked at your door for admission. Surely these are propitious times and signs of healthy growth. During my incumbency as your Secretary, in round numbers, 150 new members of the profession have sought your favorable consideration. Should this ratio of increase continue during the balance of the ten years from 1888 to 1898, your membership will in all probability reach 1000 in our country. Much of this newly-added power comes from the youth and strength of the future profession of our wonderful country, and it places upon the shoulders of those trained in the service a deep responsibility in guiding this great power and moulding its untold strength, in lines and ways of great use, for the upbuilding of our veterinary structure in America. On every side, in State and county and city, are budding forth associations of veterinarians, all training their guns upon this parent Association looking for the word of command to so direct the powers of their ammunition in telling directions where it may not be spent on vacant space and be lost forever in the din and smoke that follow in its train. Upon us falls the grave responsibilities of centering our greatest forces upon all questions of a national character, that the mere local work should devolve in its chief detail upon the lesser organizations, where time and position fit it better to rest and be performed.

In national sanitary work, in national meat inspection, in national laws as to contagious and infectious disease, the commercial interests of our nation at home and abroad command our salutary support and influence in sustaining our place among the nations of the world as the

great producer of food and food products for the whole earth. National and State laws to better protect our people from disease, direct and indirect, should be yearly considered by this Association. Sanitation, in its wide and inestimable importance, should receive at our hands a broad consideration, that public sentiment might better be moulded to yield to our profession its chief place as sanitarians in all this work the world over. National ethics, of which I hear whispering sounds down along the line of our numbers, should here be given an impetus that shall award it its proper status in country, State, and city. Veterinary jurisprudence, in the hope of better and more justly uniform laws, is before you to-day, and I trust it may sound the alarm down along the ranks, that shall carry sufficient force to return to us again in a clearing away of the debris of useless and worthless decisions that make up the laws to-day that govern the decision of these important points to us, and thus free us from the injustice we suffer, and remove us from the unfair criticisms that often make us the laughingstock of our ignorant employers.

Our country, so rapidly assuming a first place among the nations as a producer of the finest specimens of every form and kind of domestic animals, should command our attention in enlightening the world on breeding statistics, and the relative part thus played in heredity, etc., should be a self-assumed task upon our part. In addition, our Association should be doing some work looking to the avoidance of the importation of diseases heretofore unknown in our breeding districts, and taking fitting recognition in the future of such outbreaks as the fatal one of "Dourine" in Illinois.

Surely, the older nations of the earth are looking to this youthful, unrestrained, but always practical nation, to play a more important part in the veterinary annals in the world's work in the future than we have done in the past. From this organization should emerge the plans and directing forces, and I hope we shall not be unmindful to day of the opportunities that are within our grasp. The World's Fair, but two years hence, offers a fitting opportunity for us to step forward into line with all the older veterinary worlds, and I trust this Association will take proper and active steps looking to an international meeting in Chicago in 1893. We should be early in the field with our announcements, and thus have all future gatherings of veterinarians planning in unison their work, that it may better fit into the work for us to do in 1893.

Sources of veterinary education in our land should ever be watched by us with a zealous eye, and we should be quick to respond in just recognition to every movement upon the part of veterinary educational institutions to increase their power and to broaden their course of instruction. We cannot control our schools, but we can do that which is better in a nation living under a republican form of government—we can mould and fashion public opinion throughout our land that shall justly meas-

ure to each educational source its value and worth, and thus strengthen our own place in national work that shall make us a more useful body in the future than we have so filled as an ornamental and obstructive body in the past.

These are a few of the thoughts suggesting themselves to me since I have filled your office as Secretary, and I take the liberty of incorporating them in my report.

During the past year our Association has been represented in every veterinary gathering held in our country, through the faithful support and assistance of our Assistant State Secretaries, by my presence as your representative, or by letter in your behalf. I have given aid and encouraging support in every meeting of veterinarians, and urged their union with us in carrying forward the work that is ours to do. Through public press and veterinary journals I have endeavored to strengthen our organization in every way that I could; keeping before them at all times something of interest to awaken them to a keener sense of duty. Through printed matter, the output of your Publication Committee, I have placed in every nook and corner of our broad land some seed to germinate that I hope in the future will flower to shed fragrance on this body.

I have compiled for your use a list of veterinarians, now numbering 1300, spread over the entire country, their correct addresses, and of what colleges they are graduates of. I have almost completed a complete file of every member of this organization since its birth, and only the lack of records so imperfectly kept has forbidden me to trace in completion their entire history as a part of the records of this Association. As books of reference for future officers of this Association these books are invaluable. The sending forth of at least three statements of their respective indebtedness to the Association of each member has been a valuable reminder to all, and your increased treasury, with a tenfold multiplication of your expenses, attests the value and efficacy of this work.

No member henceforth can be one of our number without a proper record being on file, showing his qualifications, etc., neither can he be in possession of our certificate of membership without there being on file, in sustaining his claim, his signature to our Constitution and By-laws, a copy of which has been placed in every member's hands, and one to each new one with his application blank.

For this meeting some nine hundred programmes, railroad notices, etc., have been sent out, and at this writing less than ten have been returned undelivered. The newspaper press has been in many ways notified of our existence, and no opportunity has been lost to bring our organization into that just prominence she so richly deserves.

All this, and much more, has been performed in your interest and

welfare, and it has been at a fearful expenditure of time and labor. The pecuniary compensation is wholly inadequate to assure you of the continuance of this work, unless our good fortune shall drop on one of you whose heart will grow wrapt up in the work as I have, and found my mind continually planning. I would, therefore, recommend the consideration of an increased salary as a stimulus to this work ; and with the hope that some one will after to-day take up and make grander and better the work already done, and thanking you all for your warm support and encouragement, I give you notice at this time that there are no contingencies, or train of circumstances, that can lead me to accept this onerous position again. I, therefore, submit for your consideration my final report.

W. HORACE HOSKINS,
Secretary.

REPORTS OF STATE SECRETARIES.

MICHIGAN.

AGRICULTURAL COLLEGE P. O., INGHAM CO., MICH., Sept. 9, 1891.

SIR: The veterinary profession in this State, I think I am justified in saying, is in a very prosperous condition as far as amount of practice coming into the hands of the individual members of it; again, it is prosperous on account of the annual addition of educated members to its ranks, and as a consequence the status of it is ever rapidly rising.

The only organization that we can boast of is the Michigan Veterinary Medical Association, which has a regular annual meeting, at which topics of interest to its members are freely discussed. During the past summer the Ohio and Michigan Associations held a joint meeting that was very enjoyable as well as instructive.

In order that you may have some idea of the contagious diseases that we have to encounter from time to time, I enclose you some clippings from the report of the State Veterinarian, but have to add to it that for some, at present, unaccountable reason, purpura hæmorrhagica has prevailed in various parts of the State more than I ever knew it to before, so much so that I have been brought in contact with more cases this year than I have seen before in fifteen or twenty years.

Yours very respectfully,

E. A. A. GRANGE,

Assistant State Secretary.

LANSING, January 1, 1891.

E. A. A. GRANGE, State Veterinarian, to the Hon. H. H. HINDE,
President of the Michigan Live Stock Sanitary Commission:

SIR: Since submitting my second biennial report I have had occasion to visit many counties of this State for the purpose of investigating alleged outbreaks of contagious disease in the various classes of our domestic animals. Among horses I have condemned some forty-eight animals as being affected with that loathsome disease known as glanders. Among cattle I have condemned a few head as being affected with a disease similar to consumption in man, but generally called tuberculosis when affecting bovines.

I have also had occasion to investigate an outbreak of rabies among cattle, the result of wounds inflicted by a mad dog.

I was called upon last fall to investigate a supposed outbreak of anthrax among horses, and from the description I got of the actions of the animals before their death, and the post-mortem lesions, led me to believe that this disease was the cause of their complaint. In them the disorder ran its course so rapidly that the last one was dead before I reached the scene of the difficulty, notwithstanding the fact that I arrived at the spot as soon as it was possible to do so after receiving instructions to proceed.

Earlier in the season I was instructed to proceed to Milan, in the southern part of the State, to investigate a supposed outbreak of contagious pleuro-pneumonia in cattle, but I was soon able to determine that this much-dreaded disease did not exist among the affected herd.

Upon learning the peculiarities in connection with the symptoms in the diseased creatures I was at once impressed with the idea that I had more than a common cattle disease to deal with, and upon further inquiry as to surrounding circumstances, etc., I was informed that this outbreak was in the same locality as that which became notorious a year or two ago on account of a disastrous invasion of tyrotoxicon poisoning in the family of William Evans, most interestingly described by Dr. Vaughan, of the Michigan University, in the report of the State Board of Health. This disease has never been described as affecting the lower animals, that I am aware of, but upon receiving an account of the symptoms in the Evans family from one of the survivors of the outbreak, I was struck with the close resemblance they bore to the affected cattle, but more particularly to the farm dog, which I was told partook somewhat freely of the carcass of one steer that died; the dog, a great favorite, was soon stricken with disease, and for some days his life was despaired of, though when I saw him he was convalescing slowly, as were also the surviving cattle. Another interesting fact in connection with this outbreak is that the old farmhouse, in which the disease first made its appearance in the Evans family, was condemned as being unfit for human habitation, but was thought good enough for a cattle shed, and was converted into one; whether this had any connection with the disease in the cattle or not is impossible for me to say, but the fact still remains as food for thought. Owing to the sudden death of some of the animals, and the somewhat rapid recovery of others, I had not the opportunity of investigating this disease to the end or to the extent that I desired.

Among sheep I have been called upon to investigate a serious outbreak of tape-worm plague at Lakeview, in August, 1889. This is the first outbreak of the complaint that my attention has been called to in this State, though the disorder was brought under my notice in other parts a few years ago.

I have also been called on a number of occasions to investigate alleged

outbreaks of actinomycosis, and have condemned a number of animals as being affected with it.

The light which recent investigation has thrown upon this disorder has brought it before the public in a more serious form than was even dreamed of a few years ago. Owing to what appeared to be an increase of the disease in this State, as well as from the fact that there are many features of it still wrapped in the greatest obscurity, the Michigan Experiment Station, in consort with the Live Stock Commission, has undertaken an investigation of this disorder, but sufficient time has not elapsed yet for definite results, though many experiments are now in progress. These experiments have been directed: First, toward the cause of disease; second, to determine if the disease is communicable from animal to animal; third, to determine as far as possible what animals are most susceptible to it; fourth, to determine if the poison will grow upon grass or other aliment at ordinary temperatures, or to discover, if possible, the most favorable substance for the poison of this disease to exist or thrive upon; fifth, to test the effect of cooking upon the microbes, and determine, if possible, what degree of heat is required to destroy them. These and like questions will no doubt be settled ere long.

This disease has created so much comment in legislative halls, agricultural newspapers, and other places, that for the information of those who are not familiar with its peculiarities I have taken the liberty of incorporating in this report a general outline of symptoms, etc., in connection with it.

NEW JERSEY.

MR. PRESIDENT AND GENTLEMEN OF THE U. S. VETERINARY MEDICAL ASSOCIATION: I have the honor to present herewith my report as your resident State Secretary in New Jersey for 1891.

"New Jersey is out of the Union." I do not use this expression as it has sometimes been used, but it is applicable to the profession in our State. New Jersey has two regularly incorporated State associations, while most of her sister States can only lay claim to one; and, if I am correctly informed, there are two or three States that have no veterinary society of any kind. We should certainly be satisfied as far as veterinary associations are concerned, but her veterinarians will have to be active, as much will be expected of her. The only material difference between the associations is that the original one admitted non-graduates as well as graduates, whereas only college graduates are eligible to membership in the newer organization. I would say to the veterinarians from New Jersey here present that they should remember at all times that these are kindred societies, and there are not, at least there should not be, any antagonism between them. Veterinarians, as well as other people, are free citizens in this country, and have a right to form as

many organizations as they choose so long as their laws do not conflict with State or national laws.

The veterinarians of New Jersey have accomplished something in the way of legislation. On the 4th of March, 1889, an act was passed by the Legislature to protect the title of veterinary surgeons and to regulate the practice of veterinary medicine and surgery. The first section of the act declares that all persons practising or using the title must be graduates, except as provided for in Section 2, and that practitioners shall be required to register in the County Clerk's office.

The second section states that any person who has assumed the title of veterinary surgeon, or analogous title, in the State for the five years preceding the passage of the act, without being entitled to the degree of veterinary surgeon or analogous title, shall be allowed to continue the use of the title; but such person shall appear before the County Clerk of the county in which he resides and make affidavit of that fact; he shall then be recorded as an "existing practitioner."

Section 3 directs each County Clerk in the State to provide a book, to be known as the "Veterinary Medical Register."

Section 4 provides for the County Clerk's fee, and requires that the registration shall take place within six months from the passage of the act.

Section 5 allows any veterinarian with a legal title to use the same in New Jersey, but if he opens an office, or uses the title for the transaction of business, he shall be deemed a "sojourner," and shall conform to the requirements of the act.

Section 6 provides for the registration of college graduates who may desire to commence practice in New Jersey.

Section 7 provides a penalty for not conforming to the act. Any person who shall be deemed guilty of a misdemeanor shall, on conviction, be punished for each and every offence by a fine of \$100, or shall be imprisoned for a term not exceeding one year, or both or either, at the discretion of the court.

Section 8. No person can recover money for professional services unless he is registered in compliance with the act.

Section 9 makes it the duty of the County Clerk of each county to furnish to all incorporated veterinary associations and societies of the State, and to the State Board of Health, a list of all veterinarians registered under the law, together with the name and place of the institution purporting to confer such diploma, and shall also include in such list the names of those veterinary practitioners filing affidavits, as mentioned in the foregoing section of the act. The County Clerk shall also keep an index of all veterinary practitioners.

Section 10 declares that the act shall take effect immediately.

Although this law has been on our statute books for two years and a

half, yet, so far as I am aware, there have been no prosecutions, and the force of the act has not been tested in our courts. There are still a large number of persons practising illegally; but the law has, at least, some moral effect if no other.

It has been the duty of the State Board of Health to deal with the contagious animal diseases in our State, and Dr. Hunt, its chief executive officer, has been untiring in his efforts to bring about the best results possible. But Dr. Hunt has not had the necessary facilities and a sufficient appropriation to deal with these diseases successfully. Another difficulty he experienced was due to the peculiar location of the State and the large amount of inter-state traffic in animals. Considering the nature of contagious pleuro-pneumonia and the peculiar position of the State, it was evident that if the plague was ever to be exterminated it would only be by Federal control. The United States Bureau of Animal Industry came to the rescue of the State Board of Health, and it was found necessary to quarantine Hudson county. The work of extermination has progressed to the satisfaction of all concerned. I am pleased to be able to state to-day to this convention that it is my candid opinion that we are nearing the time when this plague will be annihilated in New Jersey. This is not only of pecuniary value to our State, but it concerns the animal industry of the nation. The effect of the extermination of pleuro-pneumonia in New Jersey will be of paramount financial and commercial value.

Bovine tuberculosis is reported as being prevalent in New Jersey, and the State Board of Health is at the present time engaged in collecting data on the subject.

The loss to farmers and milkmen from parturient apoplexy is very large in our State, and although not a contagious disease, yet I am of opinion that the State Board of Health or this Association should take measures to acquaint farmers as to its prevention.

Hereditary diseases deserve more attention than is given them. All animals with hereditary taint should be condemned and excluded from the stud. This is a matter that could be controlled to advantage by the State.

We have a Dairy Commissioner in New Jersey, who is doing good work.

In conclusion, I am pleased to be able to report that veterinary science is making rapid advancement in many ways in New Jersey, but I must forbear going into further detail at this time.

WM. HERBERT LOWE,

Resident State Secretary, New Jersey.

REPORT OF FOREIGN SECRETARY.

W. HORACE HOSKINS, D.V.S.,

Secretary United States Veterinary Medical Association.

SIR: As Foreign Secretary of the United States Veterinary Medical Association for New Brunswick, Canada, I have nothing of special interest to report, the province being singularly free from epizootic and contagious diseases in all animals during the year, and, excepting anomalies met with in daily practice, the relation or description of which would be misplaced in a report of this kind, where general information is desired, nothing has occurred which calls for special comment.

In October, 1890, an outbreak of influenza occurred, not generally distributed; special characteristics, exceptionally high temperature, 106, 107, 107½; with but little acceleration of the pulse or respiration. Animals affected which presented these unusual phenomena at the outset made the quickest and best recoveries. Where laryngitis was an accompaniment recoveries were tedious and prolonged; frequent sequel, laryngismus paralyticus. Pneumonia as a complication was seldom noticed, and then only from significant causes. No special treatment. Quinine, antipyrin, antifebrine were given a faithful trial, and in my hands did not justify the expenditure of money in procuring them.

Yours, etc.,

JAMES H. FRINCK, V.S.

REPORT OF COLLEGE COMMITTEE.

AMERICAN VETERINARY COLLEGE, NEW YORK, Sept. 3, 1891.

DR. C. C. LYFORD, Chairman.

DEAR SIR: Yours of August 31st at hand. It offers me two questions to solve, and I will try to do so.

1st. What would be considered the necessary requirements of standard for uniform veterinary education? I do not think that there is any doubt about that. Veterinary education can have but one standard and one curriculum, viz., to cover all the branches of medical science as applied to veterinary practice.

2d. What would I be willing to do in the matter of obtaining such a standard? This may imply that if I have thought that I had done all I could in the matter for the last thirty years I was much in error; but if I have done my duty I will say that I intend keeping in the work in which I have been engaged with the same energy and enthusiasm as I have done since I started in 1863.

Yours respectfully,

A. LIAUTARD.

176 UNIVERSITY STREET, MONTREAL, Sept. 7, 1891.

MY DEAR LYFORD: Referring to yours of August 31st, in reply I beg to send you our calendar, which gives, as near as we can at present attempt, the standard of requirements for veterinary education. If a uniform standard could be adopted (which I doubt), I would suggest a more severe and higher educational matriculative examination.

I am quite prepared to meet, at any place agreed upon, the teachers of the various veterinary schools or faculties of universities, to discuss the subject, and do all I can to bring about a uniform standard of education and professional training. This I consider the only true way to break up the too common methods of conducting the teaching at present followed, which, however profitable, pecuniarily, the schools may be to those conducting them, are well known to be most damaging to the best interests of the profession and, I would say, also to the live-stock interests of the United States and Canada.

Yours very truly,

D. McEACHRAN.

KANSAS CITY, MO., Sept. 9, 1891.

DR. C. C. LYFORD, Minneapolis, Minn.

DEAR SIR: I received your letter some days ago. In reply to the question as to the standard required for uniform veterinary education, I

hardly know what reply to make, as I have never had the subject brought before me until your letter. The Kansas City Veterinary College will do all in its power to aid in advancing the profession. If you have any plan of procedure mapped out we would be pleased to consider it.

Yours very respectfully,

H. A. WATTLES,

1121 and 1123 Grand Ave., Kansas City, Mo.

BROOKLYN, N. Y., Sept., 1891.

DR. C. C. LYFORD.

DEAR SIR: Yours of the 31st at hand. The act regulating the standard of medical education in this State, which became a law recently, is none too good for the veterinary profession. In addition, I would suggest, viz.:

1st. That a careful record be made of the attendance of students on all lectures.

2d. That students failing to attend a minimum of lectures be excluded from the examinations.

Very truly yours,

HARRY D. GILL,

Secretary N. Y. C. V. S.

CORNELL UNIVERSITY, ITHACA, N. Y., Sept. 21, 1891.

DR. C. C. LYFORD.

DEAR SIR: Absence from home has prevented me from promptly answering your favor of the 1st inst. In the present state of medical science the veterinary student should devote at least *three years of nine months each* to the acquirement of a knowledge of his profession. In most European countries the time devoted to this is four years, and very many have to take a year additional before they can successfully pass the required tests.

As regards the subjects, besides a good English education some knowledge of Latin is very desirable. If a little Greek and French or German can be secured, so much the better for the candidate. Then, as to professional studies, a full course in anatomy, physiology, hygiene, and dietetics of all domestic animals from horses to fowls should be given. Then histology, general and special; surgical anatomy; surgery, general and operative; chemistry, general and special, including physiological, pharmaceutical, chemistry of foods and waters, and of poisons; pathology; morbid histology in the different animals; theory and practice of medicine; principles of reproduction and breeding; veterinary obstetrics; shoeing of the normal and diseased foot; lameness; examinations for soundness and veterinary jurisprudence; bacteriology; epidemiology; parasitism; sanitary and State medicine; hospital and chemical experience.

I shall do what I can, but our trustees do not provide for a full course, and we give no veterinary degrees.

Yours faithfully,

JAMES LAW.

VETERINARY DEPARTMENT, HARVARD UNIV., BOSTON, Sept. 22, 1891.

PROF. C. C. LYFORD.

DEAR SIR: Your letter of the 31st ult. came to me upon my return from a two months' vacation, yesterday. Harvard University will be not only willing, but glad, to go into a discussion of the question of a uniform veterinary education for the United States whenever a time arrives when such a discussion will seem to offer a reasonable chance of success. You will not miss my earlier reply, because my feeling is now just as it has been for the four or five years past, during which time I have regularly given it to the chairman of your committee, at his request, once a year.

Yours very truly,

CHARLES P. LYMAN.

CHICAGO VETERINARY COLLEGE, CHICAGO, Sept. 14, 1891.

DR. LYFORD, Willard's Hotel, Washington, D. C.

DEAR SIR: Yours of the 30th ult. came during my absence. In reply: It is inferred from the question, "Necessary requirements of standard for uniform veterinary education, and what you would be willing to do in the matter of obtaining such a standard," that you refer to a three-years' term. In considering the subject of veterinary education, it has a practical as well as a theoretical side to be considered; in theory, the advocates of a three-years' course are correct. It must be borne in mind that only one or two of the forty-two States of the Union have any legal qualification defining what shall constitute a veterinary practitioner, and none of the States any enactment as to what constitutes a veterinary college.

The history of human medicine in this country shows that it took nearly a century to educate the people sufficiently to obtain a legal status in the practice of human medicine, and consequently it is not to be wondered at that the public are slow to recognize the claims of the veterinarian for legal qualifications on the short acquaintance the public have had with the profession. The introduction of qualified men, especially in the rural districts, is so recent that the farmers have not yet realized to a sufficient degree the necessity of such protection as a benefit to their individual interests, and until they do, we, as veterinarians, are powerless to advance beyond the public in that direction. The idea of a man trying to lift himself up by his boot-straps is purely chimerical, and for us, as veterinarians, to try and make ourselves believe that we can lift ourselves away above public appreciation is equally chimerical.

Supposing that the present schools that are exclusively veterinary, having not one but many practising veterinarians on their educational staff, should adopt the three-years' course, it would be the incentive for mushroom colleges to spring up wherever ambitious individuals saw fit

to establish one, with no power on earth to prevent them; they would be patronized on account of it costing the student less in both time and money to obtain what is termed a diploma.

Allow me to suggest that the American schools are ahead of the literature of our text-books, and that the average Yankee boy that has to hoe his own row will accomplish as much in the two-term course as the young man of means will in three, and that is the class we have so far largely drawn our students from.

The United States Veterinary Medical Association can rest assured that the Chicago Veterinary College will not be found wanting when it is found practical to raise the course to three terms of six months each.

Yours respectfully,

R. J. WITHERS.

IOWA STATE BOARD OF HEALTH, AMES, Sept. 4, 1891.

DR. LYFORD, Minneapolis.

DEAR SIR: Yours of September 1st just received. In answer, will say, it is my judgment that no student should be allowed to matriculate as a veterinary student who cannot pass the examination required in his State to secure a certificate to teach in the public schools. This is our basis for admission, and we find that it works well. All students are not required to bring a teacher's certificate; but in case they do not, they must pass an examination which would give as good test of scholarship. This is probably as high as it would be practical to place the requirements at present. It is low enough, and any college not making at least such requirements is a positive detriment to the cause of veterinary education. To me, by far the most discouraging and disagreeable feature of my work is having to face the fact that a very large proportion of the veterinary work done in the educational line is little else than placing a paper in the hands of ignoramuses calculated to make quackery in some sense respectable.

I am yours very truly,

M. STALKER.

REPORT OF THE COMMITTEE ON DISEASES.

To the Members of the United States Veterinary Medical Association :

GENTLEMEN: There seems to be no definite idea extant as to the specific duties of this committee. However, the name, "Committee on Diseases" indicates that it was certainly not your intention to permit the members of that committee, at least, to dwarf their minds by confining them to the narrow limits of any special field of veterinary medicines

"No pent-up Uti-ca contracts his powers,
But the whole boundless continent (of medicine) is ours."

The subject, "Diseases," is at once so varied and extensive that an attempt at a comprehensive review of it must of necessity result in a report of but little interest and no scientific value.

As the gods of ancient days are said to have piled Pelion upon Ossa, and then on the top of these Olympus, in an effort to reach the heavens, so have the gods of modern medical science—the original investigators—accumulated mountains upon mountains of facts in an effort to reach final truths and practical results until the field of medical knowledge has become so vast that no human mind can encompass its limits.

Therefore, inasmuch as the necessity for specification becomes more imperative with each successive stage in the advancement of the science, if it is not transcending the limits of our duties, we would respectfully recommend that in the future the work of this committee be limited to a special class of diseases, and that regular committees be appointed for work in other special fields.

The committee has no statistics to offer concerning diseases, partly because of the absence of reliable data, but especially because we believe that a mere collection of statistics is of more than doubtful value unless subjected to a most careful analysis.

We merely desire to briefly call your attention to a few facts concerning some of the more important diseases.

TUBERCULOSIS.

Pulmonary tuberculosis is frequently seen by the practitioner of veterinary medicine in the Northern States; but Dr. Bridges, of this committee, after some investigation of the subject, has reached the conclusion that it is rarely seen in the Southern States. In range cattle it is not

common, even in the Northern and Western States, but in dairy herds, or where the hygienic conditions are bad, it is of frequent occurrence.

From this we might infer that the danger to the human family is much greater from the milk than from the meat supply. But as the milk is not likely to be contaminated with the bacilli, unless the udder is diseased, and since the animals slaughtered by local butchers are not of the best class, the greater source of danger is probably from the meat supply. If the system of Government inspection, such as in vogue at some of the large slaughtering-houses throughout the country, was properly conducted, and all tuberculous animals condemned, some danger would be averted, but while all local country butchers and meat dealers are permitted to sell to their unsuspecting and unprotected customers meat diseased or otherwise, as the animals are diseased or healthy, just so long will the chief source of danger from the meat supply remain.

As before stated, dairy cattle are more frequently affected than beef stock, and consequently there is much need for a thorough inspection of dairy cattle. During the year not only a preventive but a cure for this disease has been announced in a manner more becoming a circus manager than a scientific profession. The great Koch was said to have discovered a cure for tuberculosis; but, alas! the test of science, impartially conducted, has dissipated our fond hopes. Tuberculin, while an advance in scientific medicine, as indicating the path that prophylactic medicine must probably follow, has joined that long list of exploded "cures" and "preventives" of which the most modern are Pasteur's inoculation for rabies, and Billings's preventive for hog cholera. It is a dark shadow of a bright hope, but from it we may learn the lesson of caution which Science imposes upon her votaries.

HOG CHOLERA.

This disease is prevalent in many of the hog-raising States, and is doing a large amount of damage.

We are told by the Bureau of Animal Industry that there are two distinct diseases of swine which assume the proportions of a plague. In support of this statement, which we are expected to believe, we are given no differences in pathology nor clinical history by which the ordinary practitioner can differentiate the diseases. In fact, the experts of the Bureau admit that only through bacteriological investigations can a diagnosis be made. *Is bacteriological science developed to that state of accuracy to justify such confidence in its conclusions?*

If there are two distinct diseases worthy the name of a plague they must have a distinct pathology. If they have not, then we require more evidence that they are produced by different germs. Let us have the pathological anatomy of these two diseases, and if the gross lesions are

not sufficient for a diagnosis, let us have their microscopical differences. There are probably two diseases, but the evidence is insufficient for a dogmatic assertion. In science we are willing to accept the statements of reputable men as to matters of fact; but when it comes to accepting conclusions drawn from those facts, the case is an entirely different one.

So early as 1883 the Bureau of Animal Industry ("Contagious Diseases of Domesticated Animals"), page 89, promised a preventive in the near future, but as yet it has not materialized.

Dr. Billings has also made claims of having discovered a preventive for hog cholera, but the results have been such as to render his "discovery" of more than doubtful value. If he has a reliable preventive he has certainly been most unfortunate in his experiments.

TEXAS FEVER. .

This disease is becoming more rare in the Northern States, owing, no doubt, to the excellent regulations of the Bureau of Animal Industry and the co-operation of local and State authorities. But in the Southern States it is still recognized as the chief enemy to the development of the better breeds of cattle. The importation of Northern cattle into the permanently infected districts is attended with such heavy loss that traffic of this kind remains very small. There is much difference of opinion as to the micro-organism producing this disease. Billings and Paquin seem to be working with the same germ, and on many points to have reached similar conclusions. Their methods of work have been criticised; but, after making due allowance for all lack of care in that respect, they seem to have many facts to support their assertions. Accepting Billings's statements as correct, he has the requisite proof to substantiate his statement that the ovoid germ described by him is the cause of the disease; and Paquin's case is only weak in the fact that he has not established the complete life-history of his germ. However, Dr. Smith, the bacteriologist of the Bureau of Animal Industry, claims that a protozoan which he has discovered in the protoplasm of the red blood-corpuscles is the cause of the disease. In support of this statement is given the fact that it is always a concomitant of the disease, and that during the disease this protozoan causes a disintegration of the blood-corpuscles. For instance, during health there are about 5,500,000, red corpuscles in a cubic millimetre of blood, but in Texas fever Dr. Smith has proved, by actual count, that the ravages of this organism reduces the number to as low as 1,500,000, at which point the animal dies. Is this sufficient evidence that the germ produces the disease? It certainly is not, and cannot be accepted as such by any scientific man. If Dr. Smith has other facts in support of his statements that have been made he has not given them to the public. This protozoan may be the cause

of the disease, but before such can be considered established there must be more evidence. There is also much difference of opinion concerning the manner in which Southern cattle infect Northern pastures.

Paquin and Billings think the manure and urine the chief means of contamination; but others doubt this statement, and charge the responsibility to a tick that is found on Southern cattle. It appears that this theory has little inherent probability, but investigations may prove it to be correct. In calling your attention to these differences in opinion relative to important questions, we have not done so with a desire to criticise, but merely to more forcibly impress upon your minds the necessity of more laboratories and more investigators.

The Bureau of Animal Industry has done much good work, as have also Drs. Billings and Paquin, but the results of all alike have been marred by a morbid desire for priority. A certain amount of this is excusable, but from the Bureau of Animal Industry, because of its public character, we are wont to expect information of a reliable nature.

OSTEO-POROSIS.

Owing to the great prevalence of the disease known as osteo-porosis throughout the Eastern and Southern States, and the consequent heavy loss to stock owners, we respectfully recommend that a resolution be sent from this Association to the Secretary of Agriculture, asking that the Bureau of Animal Industry investigate this disease in the near future.

The above is respectfully submitted.

TAIT BUTLER,
Chairman.

DISCUSSION.

Dr. FAUST: One of his assertions was that Dr. Koch has claimed to cure tuberculosis, which statement is wrong, and must be stricken out of Dr. Butler's paper. He has never made that statement—never made such an assertion, either publicly or privately, as I have read.

Dr. WAUGH: I second Dr. Faust's motion to strike out that remark in the paper of Dr. Butler.

The SECRETARY: Dr. Butler simply made a criticism of it, and made no absolute statement.

The VICE-PRESIDENT: Dr. Faust's statement will simply go on record as denying a portion of the report.

Dr. LOWE: I do not think we have any right to change Dr. Butler's paper. We may, of course, comment on it.

The VICE-PRESIDENT: We have not any right to take any statement out of the report of Dr. Butler.

TWENTY-NINTH ANNUAL MEETING,
UNITED STATES VETERINARY MEDICAL ASSOCIATION,

HELD AT BOSTON, MASS.,

SEPTEMBER 20, 21, AND 22, 1892.

MINUTES OF THE PROCEEDINGS
OF THE
UNITED STATES VETERINARY MEDICAL ASSOCIATION
AT ITS TWENTY-NINTH ANNUAL MEETING,
HELD AT
BOSTON, MASS., SEPTEMBER, 1892.

FIRST DAY.—*Morning Session.*

THE meeting was called to order by the President, DR. HUIDEKOPER, September 20th at 10 A.M., in Union Hall. On roll-call by the Secretary the following were present: Drs. Ackerman, Allen, Bates, Brownell, Bryden, Claria, Clement, Curtice, William Dougherty, Eves, Faville, Flagg, Frinck, Goentner, Hall, Hitchcock, Hoskins, Howard, Huidekoper, Huntington, Kilborne, Labaw, Liautard, Lowe, McLaughlin, L. McLean, R. A. McLean, Nesbitt, Niles, Osgood, Pendry, G. P. Penniman, Perry, Peters, J. B. Rayner, T. B. Rayner, A. K. Robertson, James L. Robertson, A. H. Rose, Salmon, J. S. Saunders, Schwartzkopff, Sherman, Stewart, Stickney, Walrath, W. L. Williams, and Winchester.

The following, not members of the Association, were present at the various sessions of the Convention: Dr. John R. Hart, of Philadelphia, Pa.; Dr. E. Mayhew Michener, of Colmar, Pa.; Jesse H. Viles, 14 Coral St., Lowell, Mass.; Dr. W. H. Cooper, of Jersey City, N. J.; Dr. William Jakeman, of Halifax, N. S.; Dr. Edward C. Beckett, of Boston, Mass.; Dr. A. W. Bitting, Experiment Station, Lake City, Florida; Dr. J. W. Gadsden, 128 N. 10th St., Philadelphia, Pa.; Dr. J. B. Hopper, of Ridgewood, N. J.; Dr. F. C. Wilkinson, of Claremont, N. H.; Dr. John Marshall, Dean of the Veterinary Department of the University of Pennsylvania, Philadelphia, Pa.; Dr. William Pepper, Provost of the University of Pennsylvania, Philadelphia, Pa.; Dr. J. C. Foelker, of Allentown, Pa.; Dr. H. D. Lambert, of Salem, Mass.; Dr. B. F. King, of Little Silver, N. J.; Dr. M. W. Drake, of Philadelphia, Pa.; Dr. M. Bunker, of Newton, Mass.; Dr. C. E. Winslow, of Boston,

Mass.; Dr. C. H. Peabody, of Providence, R. I.; Mr. C. F. Winchester, of Lawrence, Mass.; Dr. H. W. Tolles, of Nashua, N. H.

The minutes of the previous meeting were read, and, on motion, were approved as read.

Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, Washington, D. C., said: "I would like to ask the Secretary what action was taken in regard to the Report of the Committee on Intelligence and Education?"

The PRESIDENT: It was received and placed on file.

The President addressed the Association as follows:

GENTLEMEN: A Persian proverb says: "A man may be thought clever while he is seeking wisdom, but if he imagines he has found it he is a fool."

I am afraid that too many of us are too easily satisfied with a good endeavor and an apparent success, and are too ready to rest upon the first laurels which we win. When I look back to the meeting at Washington, a little over a year ago, it raises a feeling of pride to remember how very many clever men there were amongst us, each and all bringing his mite, or load, of wisdom, and seeking to increase it by fair and honorable approbation or criticism of, or disagreement from, the ideas of others; and how we parted after a very successful meeting, thinking very much of each other. When I look over the intervening time, schedule the work which has been done, and realize the duties and opportunities which have been neglected, I hesitate to ascribe a cause for the last. Would it be more charitable to believe that we thought we had obtained sufficient wisdom, then, and are fools, or to realize that we are wanting in our loyalty to each other, to ourselves, and to our profession?

But the year is past, and the surest way to accomplish more in the next is to review what has been done and what has not been done, and try to fill in and heal over the sinuses of our deficiencies. With the twenty-eighth annual meeting, held in Washington, on September 15th and 16th of last year, we started upon a new era of progress in the history of the Association.

Instead of meeting twice a year for but a single day, which was more than half occupied by a business meeting, leaving but little time for the presentation of papers and the discussion of them, we had the previous year adopted an annual session only, to be two or more days in length. The first test of the new system was made with a two days' session, and proved a success. All business was expeditiously accomplished in the first half day, leaving us a good day and a half for the more interesting and profitable subjects for which we came. Even this, however, did not prove sufficient, and we were chagrined at having to neglect the proper

discussion which valued papers merited, and we were prevented from accepting the courtesy of the Honorable Secretary of Agriculture, and were deprived of visiting the instructive collections, museums, and laboratories which we would like to have seen. We had gone there to hold a two days' session, and we certainly held it very faithfully, only regretting that in swallowing such a quantity in so short a time there was a great likelihood that part of it would be undigested. At Washington we had present half a hundred members of the Association, and an equal number of visiting veterinarians and other scientists, who joined in our instruction and contributed information. We added a quarter hundred new and promisingly active members to our list, although we dropped from our rolls an even greater number; but the latter were the accumulation of a number of years, consisting of members whose inattention to their duties, non-payment of dues, and want of interest in the Association rendered their names on our list a disadvantage, and in some cases a positive harm to us. This decisive action of weeding out, on the part of our officers, which only obeyed our By-laws, and should have been enforced years ago, brought to some delinquents a realization of the error of their ways, and upon their repenting and settling their dues we allowed them another trial. Two honorary memberships were refused, not from any personal reasons nor intending to cast any personal reflections on the unsuccessful candidates, but from a standpoint of principle, as the Association has now for the first time awakened to an understanding of its importance and value, and that the public owes certain duties to us as well as we to the public.

The reports of our committees were comprehensive and valuable. Dr. Peters, for the Committee on Intelligence and Education, gave a broad review of the status of the various veterinary schools, and minutely criticised the character and quality of education which can be given with any degree of satisfaction in schools teaching for only two winters and in those which require three longer annual sessions.

He extensively collated the scientific investigations which had been made in the country during the previous year, bearing upon veterinary interests, giving valuable facts and data for use in present and future discussions, and deductions of his own from these, which stimulated the thinking and critical faculties of others, and so promise to lead us on to more definite conclusions.

Dr. Miller, for the Committee on Army Legislation, showed that our interest in this important subject had not been abated, but, unfortunately, also proved to us that, while it is proper to continue the agitation of this subject, the time had not yet come when the Government officials are prepared and able to recognize us in this branch of service.

Dr. Williams, for the Committee on National and International Inspection of Meat, supplemented the valuable report of Dr. Schwartz-

kopff, the chairman of the committee the previous year, and criticised, and in some respects differed from the latter in such a marked degree that we appreciated what an extensive field of investigation and research had been opened up to us.

The difference of opinions of these two well-known scientists made apparent the value and serious importance of the subject, and demanded its further study and consideration, so that the first chairman was reappointed for the present year, in order to bring the original subject into greater publicity.

The Secretary's report showed important and marked advancement in our membership, attendance, and finances, which promised a gratifying future for our well being, and possibilities of permanent valuable work, and from the report this year, by that same indefatigable industrious officer, you will see how his work in the past has commenced to produce good results, and upon what an improved basis we stand.

The State Secretaries, with but few exceptions, were found to be as perfect representatives of inefficiency as the General Secretary is of efficiency. Upon calling the roll we found many of the State Secretaries had just been dropped from membership of the Association, and from those who remained we heard but meagre reports or none at all. We have been more careful in the selection of State Secretaries this year.

The Committees on Colleges and Standards of Education made reports, based upon communications from others, which may have been intelligible to the correspondents who sent them, but which appeared to us to be so biased by personal interest that we saw fit to abolish these committees and search for a solution of the problem among ourselves, and deal with it for the good of the profession at large, without reference to the feelings of those who may be affected by the result.

The papers presented at our last meeting were more numerous and comprehensive than we have ever had at one meeting before: "Rachitis," by Dr. Williams, and "Barren Mares," by Dr. Lyford, were original works upon important clinical subjects. Dr. Bryden's "Transatlantic Cattle Trade and its Regulations from a Veterinary Point of View," showed the importance, from a sanitary and humane standpoint, of the question of cattle transport; and a brochure of my own upon the "Identification of Animals" was intended to elicit comment and call for more information and suggestions of local nomenclature, in order that we may arrive at a uniform method of describing animals.

You had presented for your consideration an important amendment to our By-laws in regard to the qualifications which shall be required of future applicants to membership in this Association.

We determined, by resolution, to hold the annual meeting of 1893 at Chicago, the site of the World's Fair, and to make that meeting international in character, in order to bring us into closer relationship with

the profession in the old country and to show it what we have been able to accomplish in this.

In my address at the opening of the meeting in Washington I called your attention to the importance of establishing local societies and of organizing them so that they shall be auxiliary to the National Association. I am gratified to see how much has been accomplished in this line during the past year.

The Massachusetts Association, our generous host of to-day, has never been more active, and in the representation of Massachusetts men, larger than we have ever had before, and in the amount of work which they have done, preparing for this meeting, we learn the good results which can be obtained by energetic local work. In New York State, outside of the city of New York, a strong society has been developed which is rapidly including the best class of the profession in the State.

In the Commonwealth of Pennsylvania the State organization has held large meetings, has published its last proceedings in neat pamphlet form, and has established a number of active county societies which support the State Association.

In Indiana the State Association has been reorganized by your Vice-President; and from Iowa to California we hear of new societies. But I want again to remind you of the necessity that all these shall be upon the same model, and shall be nursery schools for the parent farm, our Association.

At a meeting of the Comitia Minora, held in New York on February 20th, the place for holding the present meeting was considered with great care, and Boston was selected for several reasons. We have here many old and loyal members; it has been some time since we have met in the Northeast, and the next meeting has already been arranged to be held in the West. I believe, from the attendance which we have and from the preparations which I know have been perfected for making this a successful meeting, that we decided wisely.

At the meeting of the Comitia Minora a committee of nine was appointed to prepare and issue invitations to foreign veterinary schools and societies to send delegates to the meeting of 1893, and to arrange for their local reception and entertainment. This committee was empowered to act, but, like many of the committees of our older *regimé*, has procrastinated and lost several months of valuable time, and, instead of being able to present you with a partially accomplished scheme, and the guarantee of a foreign representation, it has only the proposition of one to lay before you. It now becomes the duty of the entire Association to act promptly upon it, and by its energy to make up for the derelict committee.

You have before you an amendment to the By-laws which establishes a standard of what, it is believed by those who propose it, should be the

necessary qualifications of education of any veterinarian who in the future is to become one of us.

This amendment must not be passed unless we intend that it shall be lived up to to the very letter of the law.

If it is passed it will establish our decision that a course of three years, of at least six months each, is requisite for the proper elementary training of the veterinarian of the future. If we believe this honestly, then we must vote upon the amendment with equal honesty, and not allow any sympathy or consideration for the effect it may have on any one existing school, its future, finances, or any personal matter, to influence our vote.

Long argument and study of this subject has proved that no governmental legislation or other means can be employed to give us the enforced longer education. We having founded in this country a representative organization of veterinarians which is so solidly based that it must remain a governing body, which is attracting the best of the younger men throughout the land; and as seen by our list of applications for membership—which is the public voice of the profession—we are the ones who must determine the standard of veterinary education, which our pioneer work has shown us is demanded for the good of our sons, our successors, and the future. This amendment is an important matter; its passage means that we believe that we must insist that our profession shall have its proper rank and recognition among the other learned ones. The aye or nay of each vote will indicate each individual's estimation of the present standing of his profession.

You will have before you a long list of applicants, veterinarians from all over the land, who are desirous of joining us. Every member owes a duty to his colleagues in the Association, as well as to himself, in protecting our good name, and if any one is cognizant of facts which render any applicant unfit to become a member he should put aside both personal feeling and sympathy and state them.

We have before us accumulated unfinished discussions from our last meeting, and more new work in the form of committee reports and papers upon scientific and practical veterinary subjects than we have ever had before.

I have made this long review of the work which we have on hand and which we have to do in the future, in order to impress you with the importance and standing which this Association has attained. From the various members whose names are on the programme, and from those who will discuss their subjects, we are promised quite as much scientific matter as we can well handle; but, while we enjoy such a mental treat, there is another subject which we must not forget and to which we pay too little attention. The practical side of veterinary medicine and the relations to the public have been too much neglected in our meetings. It is just as well that that other community—the

public—from whom we have to earn our own living, should know more of our importance and value, for when it does it will be profitable to them and we shall earn more from them. Every advance which we make in the estimation of our employer by showing an increase of scientific knowledge and practical attainment, and every proof which we can furnish of the value of our services, entitle us to charge more for them—and few of us charge enough. We, by our study, our training, and the reputable position which we take as members this Association, thereby acknowledging that our methods of doing business are those ordained by the respectable representatives of the profession, are the natural experts and recognized guardians of the care of animals in health, sickness, and when slaughtered for domestic use, in the shape of food and other products. We have a field of labor which can be better appreciated by a few statistics.

According to the last report of the Department of Agriculture (January and February, 1892), there are now in the United States about fifteen and a half million (15,498,140) horses on farms and ranches, and some two and a third million (2,314,699) mules. This is exclusive of horses in cities; including the latter we can estimate, in round numbers, about nineteen million horses and mules, valued at over one billion dollars. Sixteen and a half million (16,416,331) milch cows and over thirty-seven and a half million (37,651,239) oxen and other cattle, make a total of over fifty-four million (54,067,590) head of horned cattle, valued at over nine hundred million dollars. About forty-five million (44,938,365) sheep and fifty-two million (52,398,019) swine, together valued at three hundred and fifty million dollars, give a total of:

	Number, 1892.	Value.
Horses	15,496,140	\$1,007,593,636
Mules	2,314,699	174,882,070
Milch cows	16,416,351	351,378,132
Oxen and other cattle	37,651,239	570,749,155
Sheep	44,938,365	116,121,270
Swine	52,398,019	241,031,415
	<hr/>	<hr/>
	169,216,813	\$2,461,755,678

A comparison of the census for the decade from 1880 to 1890, and we can assume that the present increase is as great, shows that the number of horses augmented nearly 50 per cent.; the annual increase for other animals is now estimated at about 2 per cent. for horned cattle, 3 per cent. for sheep, and 3 to 4 per cent. for swine.

This vast item in the wealth of the country shows to advantage in our foreign commerce. The annual export of animals and their products to foreign countries has increased from one hundred and a quarter million

dollars (\$126,586,103), in 1889, to one hundred and eighty-one millions (\$181,718,188) for this year. The work of the veterinarian in exterminating cattle disease and the effect of proper inspections of cattle increased the value of our exports of fresh beef from eleven and a half millions (\$11,481,861). in 1889 to eighteen millions (\$18,053,732) in 1891; the exports of live cattle in the same time more than doubled (\$16,616,917 to \$35,099,095). On the other hand the value of imported animals, which amounts, in all, only to some \$3,000,000, has decreased, except in the case of sheep, which come mostly from Canada. When we add to this enormous number of animals and their values the special values of individual horses endowed with great speed or other qualities, and those of cattle for breeding purposes, and take into consideration the dogs, cats, and pet animals for which the owner will pay a far better fee for the attention, which is a luxury, we certainly have a very magnificent charge to look after; and where our services are appreciated in the preservation and augmentation of this wealth we deserve a fair remuneration for them. But it is for us to demonstrate our ability and teach the necessity of it to the public. This is a legacy we must prepare for our successors, for we will get but little benefit from it ourselves.

When at Washington last year you honored me with the Presidency of this Association for the third time, I sincerely appreciated your courtesy, but knew that I was receiving more than my share of the reward for the work which so many had done, and I am glad to vacate both the honors and duties—and the latter are not light—to my successor, and promise my cordial aid, to the extent of my ability, to both our new officers and to our fraternity in advancing our progress and in seeking wisdom that we may be thought clever.

REPORT OF COMITIA MINORA.

A special meeting of the Comitua Minora was held at the "Arena," New York City, February 20, 1892, at 8 P.M. President Huidekoper presided.

The following members were present: Drs. Huidekoper, Robertson, Liautard, R. A. McLean, Hoskins, Winchester, William Dougherty, and Thomas B. Rayner.

Absent: Drs. Williams, Stickney, and Schwartzkopff.

By appointment: Drs. Clement and Miller.

Information of unprofessional conduct being lodged against Dr. A. K. Robertson, he was cited to appear before this Board at the next regular meeting to answer the same.

The first subject to consider was the place of meeting for 1892. The Secretary read letters from Dr. Williams on this point, also an appeal from the Buffalo members of this Association to select that city. After

some discussion, Dr. T. B. Rayner moved that we meet in Buffalo; seconded by Dr. Miller.

Before putting the question a strong plea was made for Boston by several members.

The motion was then put, with four votes for Buffalo and five against.

Dr. Winchester then moved that we meet in Boston. Seconded by Dr. Miller, and adopted.

Moved that we convene for three days or more. Seconded, and carried.

Display at Chicago.

The question of having a display as an Association at the Columbian Fair was considered, and, on motion, decided against.

International Meeting, 1893.

Moved, seconded, and adopted, that we hold an International Meeting at Chicago in 1893.

Dr. Winchester moved that the Secretary be instructed to have a room at Chicago secured for the required number of days. Recalled.

Dr. Liautard moved that a committee of nine be appointed to prepare and issue invitations to foreign schools and societies, and to arrange for their local reception and entertainment. Carried unanimously.

Dr. Clement suggested that the President shall require all papers to be transmitted at least one month before the meeting.

Army Legislation.

Moved that we indorse the action of our Committee on Legislation.

Preparation of Papers.

Dr. Clement moved that the President require all papers to be transmitted at least one month before the meeting.

Resolved, That in the future those preparing papers to be read at meetings of this Association shall prepare a synopsis of such paper for submission to the Comitia Minora; by them to be referred to two members of the Association who shall be recognized leaders in the discussion of them.

Resolved, further, That all papers shall be limited in length to thirty minutes, except by the permission of the Association, in order to admit of discussion at time of reading.

After which a motion to adjourn was carried.

W. HORACE HOSKINS,
Secretary.

Subsequent to the meeting the President made the following appointments for the Committee of Arrangements for International Meeting at Chicago: R. S. Huidekoper, President; W. Horace Hoskins, Secretary; Drs. D. E. Salmon, A. H. Baker, Olof Schwartzkopff, A. Liautard, J. H. Stickney, W. L. Williams, and A. W. Clement.

As a local Committee of Arrangements for the Boston meeting the following were appointed: Drs. W. Horace Hoskins, J. F. Winchester, and L. H. Howard.

The special meeting of the Committee of Arrangements for the Annual and International Meeting at Chicago, in 1893, was called to order September 19, 1892, at 4.15 P.M., at Young's Hotel, Boston, President Huidekoper presiding.

The following members of the committee were present: Drs. Huidekoper, Hoskins, Liautard, Williams, and Schwartzkopff.

Absent: Drs. Clement, Stickney, Salmon, and Baker.

The sub-committee, consisting of Drs. Liautard and Huidekoper, through the former, reported the following suggestions, which were adopted for recommendation to the Association:

1st. That this be called the Thirtieth Annual Meeting of the United States Veterinary Medical Association and the First International Veterinary Congress of America.

2d. That we recommend that the Congress convene four days.

3d. That a circular letter be issued to foreign and home veterinarians creating for this meeting a contributing membership, entitling the subscriber to be present at the meeting and to a copy of the *Transactions* of the meeting, for which a fee of \$2 would be charged.

4th. That we recommend that an invitation be issued to each foreign National Veterinary Association or representative national veterinary body of Europe to send a delegate.

5th. That a committee be appointed to select three committees to report on the following subjects of international importance in veterinary science: Tuberculosis, Animal Food Supply, and Veterinary Education.

6th. That a special assessment be levied on each member of \$5, to defray the extraordinary expenses that will be incurred.

W. HORACE HOSKINS,
Secretary.

The meeting of the Comitia Minora called for September 19, 1892, 8 P.M., at Young's Hotel, Boston, was convened promptly at the appointed time by President Huidekoper.

On roll-call, the following members responded to their names: Drs. Huidekoper, Williams, Hoskins, Robertson, Winchester, R. A. McLean,

William Dougherty, T. B. Rayner, Liautard, Stickney, and Schwartzkopf. There were no absentees.

The minutes of the special meeting of the Comitia Minora were read and approved.

Applications for Membership.

The application of William H. Welch for honorary membership was favorably recommended. Three honorary members were elected and three applied for reinstatement. Elected, ninety-seven. Rejected, two. Laid over, six. One hundred and seven considered.

Applicants for active membership: Drs. Benjamin T. Wende (V.S., Ontario), Millgrove, Erie County, N. Y. Vouchers, N. P. Hinckley, John Wende. Edward J. McLeod (D.V.S., Chicago), 1149 Niagara St., Buffalo, N. Y. Vouchers, N. P. Hinkley, John Wende. H. D. Lambert (D.V.S., American Veterinary College), Salem, Mass. Vouchers, F. H. Osgood, L. H. Howard. Thomas G. Sherwood (M.R.C.V.S., London), 854 Seventh Ave., N. Y. City. Voucher, R. S. Huidekoper. The above, with the following exceptions, were favorably recommended for membership.

Exceptions.

Dr. John Doris, V.S., a graduate of Ohio Veterinary College, on the grounds that we do not recognize colleges which advertise to grant diplomas to minors.

Dr. W. H. Valway, graduate of New York College of Veterinary Surgeons.

The following names were laid over for one year pending investigation-into certain reasons being offered that might disqualify them: Drs. H. F. Doris, Pittsburg, Pa.; J. D. Robinson, Washington, D. C.; C. H. Pierce, Minneapolis, Minn. The name of Dr. F. A. Duclos was not considered, as his application needed a voucher.

The name of Dr. H. W. Hawley, owing to the fact that his application was not filed in his own handwriting, was also laid over.

The application of Dr. A. D. McKenney was laid over for a year, with instructions that his attention be called to his illuminated heading, which is in conflict with our Code of Ethics.

It was favorably recommended to reinstate Dr. W. S. Devoe, whose name had been among the delinquent list at Chicago.

It was favorably recommended to reinstate Dr. G. P. Penniman, who had settled up his arrearages.

The following members, whose arrearages have passed the limit allowed, were recommended for dismissal from our rolls:

Drs. A. S. Barnes, W. H. Boyd, W. E. Cuff, W. E. Daniels, C. K. Dyer, C. C. Jackson, J. Johnstone, L. M. Klutts, Alex. Plummer, John D. Rutherford, A. F. Schrieber, L. A. Thomas, John Tillie, G. W.

Werner, G. C. Williams, and R. Price and W. J. Hinman for the same cause, on the recommendation of Dr. C. C. Lyford as his voucher.

The Secretary reported the deaths of Drs. V. T. Atkinson, of Wisconsin; George Bridges, of Connecticut, and Robert Wood, of Lowell, Massachusetts.

On motion, it was ordered that a committee of three be appointed to draft suitable resolutions to be presented to the general meeting.

The President appointed Drs. R. A. McLean, Stickney, and Williams.

The Secretary reported that the railroad associations have added another rule during the year, charging the expenses of an agent to visit the railroad certificates to associations receiving the concession, at the rate of \$11 for the first day, and \$6 per day for each subsequent one that he is required to be present. The Secretary reported that he had selected the last two days for this purpose, and sent the association a check for \$17, which action was approved.

Several unclaimed certificates were ordered to be destroyed.

A motion was then made and carried that the Secretary report a bill for the extra expenses for clerical work that he had incurred in completing the work of the Association the past year.

Dr. McLean, seconded by Dr. Stickney, recommended that the seating of the newly elected officers shall take place just prior to final adjournment, and that the newly elected President shall deliver his address at the convening of the succeeding annual convention.

The local Committee of Arrangements, through Chairman Howard, reported the securing of a hall, a stenographer for the meeting, and completed the arrangements for the banquet at Young's Hotel at 6 o'clock on the evening of the 22d, the banquet fee not to exceed \$7, all of which was approved.

The Massachusetts Association requested that the Association adjourn on Wednesday at 12.30 P.M.; that the Gloucester boat engaged for our entertainment would leave Atlantic Avenue, foot of State Street, at 1.30 P.M. sharp.

The meeting then adjourned until 9 o'clock in the morning, to meet at Union Hall.

W. HORACE HOSKINS,
Secretary.

The meeting of Comitia Minora was held at Union Hall, Boston, September 20, 1892, at 9 A.M., President Huidekoper presiding. All present.

Moved to approve minutes as read.

Moved that the Secretary be instructed that no person participate unless the privileges of the floor be accorded them, or that they are members in good standing of the Association. Carried.

Dr. John T. Claris was present and made a statement.

Moved that the gentleman be allowed to resign. Carried.

Dr. A. K. Robertson was called in and made a statement.

Moved that the statement of Dr. Robertson was sufficient to warrant the dismissal of complaint. Carried.

Moved to recommend the report of the International Meeting. Carried.

Moved that toast-list be approved. Carried.

Moved to favorably recommend for membership Charles Douglass (A.V.C., Kingston), Jamaica. Vouchers, W. J. Coates, A. Liautard. William S. Lord (M.D.V., Harvard), United States Hotel, Portland, Maine. Voucher, F. W. Huntington.

Moved to adjourn. Carried.

W. HORACE HOSKINS,
Secretary.

The meeting of Comitia Minora was called to order at 9.30 A.M. Sep-21, 1892, Vice-President Williams presiding.

The following members were present: Drs. Liautard, Schwartzkopff, Dougherty, McLean, Williams, Hoskins, Winchester, and Stickney.

Absent: Dr. Thomas B. Rayner.

Application for membership: Dr. William Jakeman (V.S., Montreal), Halifax, N. S. Vouchers, J. M. Parker, L. H. Howard. Favorably recommended.

Application for reinstatement: Dr. E. C. Beckett, Boston, Mass.

Moved to recommend for reinstatement, he having complied with the requirements.

Moved to adjourn. Carried.

W. HORACE HOSKINS,
Secretary.

The meeting of Comitia Minora was called to order at 9.30 A.M., September 22, 1892, Vice-President Williams presiding.

The following members were present: Drs. Williams, R. A. McLean, Dougherty, Hoskins, Liautard, Huidekoper, and Schwartzkopff.

Absent: Drs. Winchester, Rayner, and Stickney.

Applications for membership: Drs. F. C. Wilkinson (V.S., Ontario), Claremont, N. H. Voucher, W. L. Baker. D. Edgar Smith (V.S., New York College), Great Neck, Queens County, Long Island, New York. Vouchers, R. A. McLean, R. S. Huidekoper. J. W. Gadsden (M.R.C.V.S., London), 128 N. 10th St. Philadelphia, Pa. Vouchers, J. F. Winchester, R. S. Huidekoper.

Moved that they be favorably recommended. Carried.

Moved to adopt resolution on honorary members for 1893. Carried.

Moved to adjourn. Carried.

W. HORACE HOSKINS,
Secretary.

In view of the international character of meeting of 1893, it was

Resolved, That temporary alteration of list to read that in 1893 we may elect honorary members not to exceed three to any one foreign country, and a committee of three to select the names for recommendation to report at next meeting of Comitia Minora.

Applications for Membership, Chicago, 1893.

H. F. Doris (D.V.S., American Veterinary College), No. 3, Seventh St., Pittsburgh, Pa. Voucher, W. Horace Hoskins and James A. Waugh.

F. G. Gillbank (V.S., Ontario), 439 6th St., Detroit, Michigan. Voucher, S. Brenton.

F. A. Duclos (V.S., Montreal), Laval University, Holyoke, Mass.

H. W. Hawley (D.V.S., Chicago), Chicago, Ill. Vouchers, A. H. Baker, S. S. Baker.

A. D. McKenny (V.S., Ontario), Ann Arbor, Michigan. Voucher, E. A. A. Grange,

C. H. Pierce (V.S., Ontario), Minneapolis, Minn. Vouchers, C. C. Lyford, Tait Butler.

J. D. Robinson (D.V.S., Chicago), 222 C. St., Washington, D. C. Vouchers, A. H. Baker, E. S. Walmer.

J. K. Thompson (M.R.C.V.S., Glasgow), Pueblo, Colorado.

A. G. Walker (V.M.D., University of Pennsylvania), Taunton, Mass. Vouchers, W. H. Lowe, G. P. Penniman.

On motion, the reports were received.

The PRESIDENT: We will take up the recommendations of the Comitia.

The SECRETARY: The first recommendation of your committee in that report is that we hold an International Meeting in Chicago in 1893.

DR. L. McLEAN: Is that proposition before the meeting for acceptance?

The PRESIDENT: The recommendations are now being taken up seriatim.

Dr. McLEAN: It is then open for discussion.

The PRESIDENT: Yes.

The SECRETARY: The first recommendation is that we hold an International Meeting in Chicago in 1893.

The first was adopted as read.

The next recommendation is the list of applicants presented for membership, and the first question before you is the list of members proposed for honorary membership. The first name is William H. Welch.

Dr. CURTICE: It is unfortunate that a gentleman of such high standing should be opposed. Last year the Society made two rejections in the matter of honorary membership. It had been supposed that these names

were proposed in consideration of the work they had done. In the treatment of Texas cattle fever and hog cholera during the past eight years, which appears in the books of the Department of Agriculture, Dr. Theobald Smith has made a high mark. This work will not be equalled in the next decade, I assure you. But that is the standard by which you are to acknowledge a young man. Now, what is Dr. Welch? He is not to be elected, as I understand it, because he is a friend of this or of that Society, or because he has patronized this or that Society, or because he is a hail fellow well met, but on account of the work he has done.

Dr. L. McLEAN: What has Dr. Welch done that he should be elected to honorary membership?

Dr. KILBORNE: I think one of the principal reasons cited last year against him was that if Dr. Smith was eligible for honorary membership he was equally eligible for active membership, and I know of no reason why Dr. Welch should not be a candidate for active membership, and, following the precedents set up last year it seems to me that his name should be refused honorary membership and he should be proposed for active membership, the same as was Dr. Smith last year.

Dr. SALMON: Perhaps the Comitia Minora would be willing to explain whether this is a violation of the rule laid down at the last meeting, and whether a man should be proposed for honorary membership who is eligible for active membership?

The PRESIDENT: The Chair will state that there is no such rule laid down. The recommendation of the Comitia Minora was on the question as to whether they considered that his work entitled him to honorary membership, or whether he should not have presented his name for active membership, and, of course, it is in a certain degree a matter of opinion.

Dr. SALMON: Certainly in the reading of the minutes of the last meeting it was decided that no man eligible to active membership is eligible to honorary membership.

The SECRETARY: The intention of the wording was, that even though a man might be a fit candidate for active membership, at the same time if he was so situated, by the character of his work, that he could not fulfil the duties of an active member, that then we would consider him for honorary membership in the place of active membership.

Dr. PENDRY: What is the qualification for active membership? Do you think that the fact of his being an M.D. makes him eligible?

The PRESIDENT: A man must be an M.D. in active practice.

Dr. PENDRY: Must he not be active in the pursuit of veterinary practice?

The PRESIDENT: No, sir, he is eligible if he is in human practice. I would say, myself, in seconding Dr. Welch's nomination, that he has been present at one and I think two of our meetings; at one taking a

very active part, and if I recollect, the candidate of last year has never been present at a meeting.

Dr. CURTICE: I would like to see Dr. Welch an honorary member of this Society, because we need such men, but I do think this Society laid itself open last year so that we can elect to honorary membership no one who is eligible to active membership, simply because the Society establishes the custom. The young man proposed by me last year was opposed because other men in previous years had done less and were elected to honorary membership. Now, it seems to me that all we need is to be assured that a man who has such a high position as the present nominee is worthy to become a member because he has done work in veterinary pathology which is instructive; but the claim is that he has not done as much as another man. I want the Society to be just before all.

Dr. KILBORNE: Is there any reason why Dr. Welch should not be an active member?

The PRESIDENT: None, whatever.

Dr. McLEAN: I have asked what claim he has for honorary membership. I ask for information. If he has any claim above other medical men, why should he be an honorary member? I ask if he did anything specific. I ask for information.

The PRESIDENT: The Secretary will read the recommendation.

The Secretary again read the recommendation.

Dr. CLEMENT: At the last meeting I proposed the name of Dr. Welch as an honorary member, and it has been acted upon by the Comitia Minora. I know, personally, that Dr. Welch has done a great deal of work for veterinary medicine. That his work has not been published in full is nothing against him. All the members of the Maryland Association know the work which he has done. Now, we all know that his reputation is international; that he stands very near the head of the list in his special department. I do not think that the previous action of the Association ought to be brought up in this matter.

Dr. WILLIAMS: It seems to me that we are to decide on a very important question. I agree with Dr. Salmon that the Comitia Minora has placed itself on record. We should do well to listen to the Comitia Minora of last year on that point. It seems to me that the question was brought up there, and that we have placed ourselves on record, that a man to be an honorary member of this Association shall be one who has done well-defined work; work which is not known simply to one man, as my friend has intimated, but one that is known to the profession by the record of his work; and that, at the same time, he should be in such a position and under such environment that he cannot enter into active membership. It occurs to me that the Secretary should re-read that part of the report of the Comitia Minora referring to this matter, and the Secretary's minutes will be of interest to us.

The PRESIDENT: The Secretary will read the minutes in relation to the application of Dr. Smith as an honorary member.

The Secretary read the extract.

Dr. SALMON: No one in this Association appreciates more than I do or feels more friendly to Dr. Welch than I, and when this question comes to a vote I shall vote for him for honorary membership; but what I have said, and what I shall say now, is said to emphasize my view that the action taken last year at Washington was inconsistent and unjust, action for which I can see no excuse, and no explanation except on the ground that Washington was selected for a more or less active crusade against the Bureau of Animal Industry. Dr. Smith has for years been engaged in the Bureau of Animal Industry, and for years he has been engaged in investigations which have produced the most important results.

Dr. McLEAN: This is in connection with what?

Dr. SALMON: It is in connection with Dr. Smith. Dr. Smith holds the same position as does Dr. Welch. It would be inconvenient for him and almost impossible for him to take an active part, and, not being a veterinarian, he would be interested only as an observer. I think the action of last year was a discrimination, but, notwithstanding that, I shall vote for what I believe is right and I hope Dr. Welch will be elected.

Dr. R. A. McLEAN: I am in favor of reconsidering the name of Professor Welch. I believe that the committee has stultified itself. I have met Dr. Welch and I appreciate his abilities, but still I feel that we ought to stick to the rule that we laid down at our last meeting. There is no going behind the returns. I move that the name of Dr. Welch be referred back to the Comitia Minora.

Dr. RAYNER: I do not consider, as a member of the Comitia Minora, that we have stultified ourselves in any way. Dr. Salmon has stated to you his opinion and, to an extent, I agree that possibly we made a mistake, but because we may have made a mistake last year is no reason we should make one now. Because we made a mistake in relation to the application of Dr. Smith is no reason why we should make one now. The question in regard to Dr. Smith is one which can be rectified at a future time, and we can give him honorary membership if he deserves it.

The SECRETARY: I would like to correct an impression thrown out that there was any language used in the Comitia Minora, or any influence brought upon a single member of it, that was the cause or means of an unfavorable consideration of Dr. Theobald Smith. Anyone who makes such a statement should be certain as to its truth. That matter was never brought up in a single word or by any member of the Comitia Minora, or by any member of this Association in the Comitia

Minora meeting; and if there is a member of this body who can bring proof that such was the case, or that any such intimation entered into the disposition of this matter, I should like him to rise on this floor. The Comitia Minora, as a body, are here to defend themselves from any such imputation.

Dr. L. McLEAN: I think Dr. Salmon stands on very thin ice when he makes any such statement. To think the members of this Society would show their spleen because of animosity! It seems to me it is very small.

Dr. SALMON: This discussion is getting rather longer than I had anticipated. The Secretary has misinterpreted what I said. So also has Dr. McLean.

Dr. McLEAN: I hope so.

Dr. SALMON: What I said was that I could explain the action which was taken at the Washington meeting on the understanding that a more or less active crusade has been entered upon against the Bureau of Animal Industry, and I can point to many other things done in that meeting which would fully justify the remark. At the same time I do not reflect on the Comitia Minora, and I do not think my remarks can be interpreted in that way.

Dr. PENDRY: Without any disposition to shut off debate, I would say that if we continue this discussion, instead of three days, we shall need thirteen, and I move the previous question.

Dr. WINCHESTER: I think for the edification of this body it would be well for the names of the Comitia Minora who met last year in Washington to be read.

The PRESIDENT: They all know them.

Dr. WINCHESTER: We do not want any ifs or ands about it. Let them be read and let it be known if there is any influence that could bear on them in regard to the Bureau of Animal Industry.

Dr. PENDRY: The previous question has been called.

The PRESIDENT: You have before you the motion, seconded, that the application of Dr. Welch for honorary membership be referred back to the Comitia Minora.

Dr. CLEMENT: I would like to withdraw the name of Dr. Welch.

The PRESIDENT: It is not in order. Gentlemen, you have before you the previous question of Dr. Pendry's to the motion that Dr. Welch's name be referred back to the Comitia Minora.

The motion was put and lost.

The original motion was then put accepting Dr. Welch for honorary membership, and was carried.

The Secretary read the names recommended by the Comitia Minora for election.

Honorary Membership.

Prof. A. Chauveau, Lyons, France. Director-General of the Veterinary Schools of France. Anatomist, Physiologist, Work on Contagious Diseases, etc. Proposed by Drs. R. S. Huidekoper and A. Liautard.

Isaiah Michener, Carversville, Pa. Born January 25, 1812. In active practice sixty years in Eastern Pennsylvania and the border counties of New Jersey. Was one of the earliest names in connection with the original Veterinary College in Philadelphia. Attended "Dadd's Clinics" in Boston. Honorary member of the Pennsylvania State Veterinary Medical Association. One of the first members of the profession to recognize and treat the disease which is commonly termed "Cerebro-Spinal Meningitis." Also to bring it into public notice through his accounts in public periodicals. Proposed by Drs. Thos. B. Rayner and W. Horace Hoskins.

Wm. H. Welch, M.D., Prof. of Pathology, Johns Hopkins University. Recommended by Drs. A. W. Clement and R. S. Huidekoper. Indorsed by Maryland State Veterinary Medical Association.

Active Membership.

R. A. Archibald (D.V.S., Chicago Veterinary College), Sacramento, Cal. A. H. Baker and R. J. Withers, vouchers.

Fred. W. Ashe (D.V.S., Chicago Veterinary College), Chicago, Ill. A. H. Baker and S. S. Baker, vouchers.

E. D. Bachman (D.V.S., A.V.C., Chester), Orange County, N. Y. W. H. Lowe and A. Liautard, vouchers.

W. L. Baker (V.S. Ont. V.C., 19 Port Watson St.), Cortland, N. Y. N. P. Hinkley and John Wende, vouchers.

Wm. M. Balmer (M.D.V., Harvard Veterinary College), 23 Ellsworth Ave., Cambridge, Mass. W. L. Labaw and L. H. Howard, vouchers.

Eugene C. Batten (V.M.D., Veterinary Department University of Pennsylvania), 13 Burnett St., East Orange, N. J. W. H. Lowe and W. L. Zuill, vouchers.

Otis Barnett (D.V.S., Chicago Veterinary College), Edwardsville, Ill. C. E. Hollingsworth, voucher.

Benj. S. J. Bear (V.M.D., Veterinary Department University of Pennsylvania), York, York County, Pa. W. L. Zuill, voucher.

John A. Bell (V.S., Ontario Veterinary College), 58 Court St., Watertown, N. Y. N. P. Hinkley and John Wende, vouchers.

F. E. Brooks (V.S., Ontario), 207 Market St., Paterson, N. J. W. H. Lowe, voucher.

C. R. Borden (D.V.S., American Veterinary College), 115 Broadway, Taunton, Mass. A. Liautard and W. J. Coates, vouchers.

John E. Brown (V.S., Ontario), Oskaloosa, Iowa. S. Stewart, voucher.

T. Earle Budd (D.V.S., American Veterinary College), Woodbury, N. J. E. B. Ackerman, voucher.

Alex. Burr (M.D.V., Harvard), Brighton, Mass. W. Bryden and L. H. Howard, vouchers.

Walter L. Burt (D.V.S., American Veterinary College), 26 Taber Ave., Providence, R. I. W. Horace Hoskins, voucher.

J. S. Butler (V.S., Ontario), Minneapolis, Minn. C. C. Lyford and Tait Butler, vouchers.

F. K. Chaffee (D.V.S., Chicago), Chicago, Ill. A. H. Baker and S. S. Baker, vouchers.

J. M. Chase (V.S., Ontario), Seneca Falls, N. Y. John Wende and N. P. Hinkley, vouchers.

J. M. Cherry (M.R.C.V.S., Royal College Veterinary School, Edinburgh), St. Joseph, Mo. John S. Meyer, voucher.

H. H. Choate (D.V.S., American Veterinary College), Lewiston, Maine. W. J. Coates, voucher.

J. E. Cloud (D.V.S., Chicago Veterinary College), Richmond, Ind. W. L. Williams, voucher.

A. E. Conrow (V.M.D., Veterinary and Medical Department University of Pennsylvania), Moorestown, N. J. R. S. Huidekoper, voucher.

W. W. Curry (D.V.S., American Veterinary College), Hackensack, N. J. W. H. Lowe, voucher.

A. Darling (D.V.S., McGill University, Montreal), 3230 Locust St., St. Louis, Mo. N. P. Hinkley and John Wende, vouchers.

M. H. Davitt (V.S., Ontario), 811 19th St., N. W., Washington, D.C. E. S. Walmer, voucher.

Theo. DeClyne (D.V.S., Columbia), New Durham, Hudson County, N. J. Wm. H. Lowe, voucher.

J. D. DeRonde (D.V.S., American Veterinary College), Nyack, N. Y. W. H. Lowe and E. B. Ackerman, vouchers.

Wm. H. Dodge (D.V.S., American Veterinary College), Leominster, Mass. A. Liautard and W. J. Coates, vouchers.

Chas. F. Douglass (D.V.S., American Veterinary College), 26 East St., Kingston, Jamaica. W. J. Coates and A. Liautard, vouchers.

R. A. Dunn (D.V.S., American Veterinary College), Titusville, Pa. A. Liautard and W. H. Hoskins, vouchers.

C. Frank Dwinal (D.V.S., American Veterinary College), Mechanics Falls, Me. Geo. H. Bailey, voucher.

Richard Ebbitt (M.R.C.V.S., Royal College Veterinary School, Glasgow), Omaha, Neb. A. H. Baker and S. Stewart, vouchers.

W. Thos. Edwards (V.M.D., Veterinary Department University of Pennsylvania), Clearfield, Clearfield County, Pa. W. Horace Hoskins and R. G. Webster, vouchers.

H. W. Eliot (V.S., New York College), Newark, N. J. W. H. Lowe, voucher.

Robt. W. Ellis (D.V.S., American Veterinary College), 468 West 150th St., New York City. Wm. H. Lowe, voucher.

A. M. Farrington (B.V.S., Veterinary Department of Cornell), Department of Agriculture, Washington, D. C. C. B. Michener and W. H. Lowe, vouchers.

John Forbes (M.R.C.V.S., Glasgow, Scotland), Omaha, Neb. S. Stewart, voucher.

Robert Formad (V.M.D., Veterinary Department University of Pennsylvania), 1008 North 6th St., Philadelphia. W. H. Hoskins, voucher.

Geo. B. Foss (M.D.V., Harvard), 50 Village St., Boston, Mass. W. L. Labaw and L. H. Howard, vouchers.

John W. Gadsden (M.R.C.V.S., London), 128 North 10th St., Philadelphia, Pa. J. F. Winchester and R. S. Huidekoper, vouchers.

F. H. Gage (M.D.V., Harvard), 509 West 9th St., New York City. W. H. Lowe, voucher.

Thos. Giffen (M.R.C.V.S., London), 125 West 56th St., New York City. R. S. Huidekoper, voucher.

Thos. J. Gunning (D.V.S., Chicago), Neponset, Bureau County, Ill. A. H. Baker, S. S. Baker, and C. E. Hollingsworth, vouchers.

Chas. Carrick (M.R.C.V.S., London), McKeesport, Pa. James A. Waugh, voucher.

John Hall (D.V.S., American Veterinary College), Falls City, Neb. A. Liautard and John S. Meyer, vouchers.

H. D. Hanson (D.V.S., American Veterinary College), 160 Eldridge St., New York City. A. Liautard and W. J. Coates, vouchers.

W. F. Harrison (D.V.S., American Veterinary College), Bloomfield, Essex County, N. J. W. H. Lowe, voucher.

T. D. Hinebauch (M.S., V.S., Ontario), Fargo, North Dakota. W. L. Williams, voucher.

E. H. Holden (D.V.S., American Veterinary College), Springfield, Mass. E. H. Osgood and L. H. Howard, vouchers.

Lee Hoover (D.V.S., Chicago), Richmond, Wayne County, Indiana. W. L. Williams, voucher.

John B. Hopper (D.V.S., American Veterinary College), Ridgewood, N. J. Wm. H. Lowe and A. Liautard, vouchers.

J. H. Honan (D.V.S., Ontario and American Veterinary College), Delphi, Indiana. F. B. Ackerman, voucher.

J. Huelsen (D.V.S., American Veterinary College), Abattoir, Jersey City, N. J. Wm. H. Lowe, voucher.

E. B. Ingalls (V.S., Ontario), Mohawk, N. Y. V. L. James, voucher.

Wm. Jakeman (V.S., Montreal), Halifax, N. S. John M. Parker and L. H. Howard, vouchers.

G. Allen Jarman (D.V.S., American Veterinary College), Chestertown, Md. A. J. Thompson and J. Huhne, vouchers.

N. B. Jones (V.S., Ontario), Chillicothe, Ohio. Tait Butler, voucher.

Wyatt Johnston (M.D.C.M., McGill University), Montreal, Canada.

A. W. Clement and J. F. Winchester, vouchers.

Wm. Jopling (V.S., Ontario), Owosso, Michigan. W. H. Hoskins and E. A. A. Grange, vouchers.

P. F. Kiernan (D.V.S., American Veterinary College), Jefferson Barracks, Mo. John S. Meyer, voucher.

I. N. Krowl (D.V.S., American Veterinary College), Passaic, N. J. J. F. Winchester and Austin Peters, vouchers.

H. D. Lambert (D.V.S., American Veterinary College), Salem, Mass. F. H. Osgood and L. H. Howard, vouchers.

Robert L. Leis (D.V.S., American Veterinary College), 38 Frederick St., Newark, N. J. Wm. H. Lowe, voucher.

Henry F. Leonard (M.D., M.D.V., Harvard), 297 Newbury St., Boston, Mass. F. H. Osgood and L. H. Howard, vouchers.

Chas. Lintz (V.M.D., University of Pennsylvania), 316 East Broad St., Chester, Pa. W. H. Hoskins, voucher.

E. L. Loblein (D.V.S., American Veterinary College), New Brunswick, N. J. Wm. H. Lowe, voucher.

Wm. S. Lord (M.D.V., Harvard), U. S. Hotel, Portland, Me. F. W. Huntington, voucher.

J. Payne Lowe (D.V.S., American Veterinary College), Paterson, N. J. Wm. H. Lowe and A. Liautard, vouchers.

Alex. Machan (V.S., Ontario), 71 River St., Paterson, N. J. Wm. H. Lowe, voucher.

Francis X. Mahoney (M.D.V., Harvard), 50 Village St., Boston, Mass. W. L. Labaw and L. H. Howard, vouchers.

E. Mayhew Michener (V.M.D., Veterinary Department University of Pennsylvania), Colmar, Montgomery County, Pa. W. H. Hoskins and W. L. Zuill, vouchers.

John E. Miller (V.S., B.A., Ontario), Greenville, Hunt County, Texas. E. S. Walmer and D. E. Salmon, vouchers.

C. C. Mills (D.V.S., Chicago), Mt. Palatine, Putnam County, Ill. C. E. Hollingsworth, voucher.

Claude D. Morris (V.S., Ontario), Brooklyn, N. Y. N. P. Hinkley, John Wende, and Wm. H. Lowe, vouchers.

James McDonough (D.V.S., American Veterinary College), Montclair, N. J. Wm. H. Lowe, voucher.

A. H. McIntosh (D.V.S., American Veterinary College), 113 Washington St., Morristown, N. J. Wm. H. Lowe, voucher.

E. J. McLeod (D.V.S., Chicago), 1149 Niagara St., Buffalo, N. Y. N. P. Hinkley and John Wende, vouchers.

F. A. Nief (B.S.C., D.V.S., American Veterinary College), 1342 Bush St., San Francisco, Cal. E. J. Nesbitt and E. B. Ackerman, vouchers.

Wm. L. Nunan (D.V.S., American Veterinary College), Lansdowne, Pa. W. Horace Hoskins, voucher.

E. R. Ogden (D.V.S., American Veterinary College), Orange, N. J. Wm. H. Lowe and A. Liautard, vouchers.

John M. Parker (D.V.S., Montreal), Haverhill, Mass. J. F. Winchester and L. H. Howard, vouchers.

Leonard Pearson (V.M.D., Veterinary Department University of Pennsylvania), 2200 Pine St., Philadelphia. W. H. Hoskins and A. T. Sellers, vouchers.

Thos. B. Pote (D.V.S., McGill University), Mt. Vernon, Indiana. W. L. Williams, voucher.

Howard P. Rogers (M.D.V., Harvard), Allston, Boston, Mass. D. D. Lee and L. H. Howard, vouchers.

F. S. Schoenleber (M.S.A., D.V.S., Chicago), Morris, Ill. A. H. Baker and Geo. W. Pope, vouchers.

J. H. Seale (D.V.S., McGill University), Spokane, Washington. S. B. Nelson, voucher.

A. J. Sheldon (D.V.S., American Veterinary College), 141 West 54th St., New York City. A. Liautard and W. J. Coates, vouchers.

Thos. G. Sherwood (M.R.C.V.S., London), 854 7th St., New York City. R. S. Huidekoper, voucher.

D. Edgar Smith (V.S., New York College), Great Neck, Queens County, N. Y. R. S. Huidekoper and R. A. McLean, vouchers.

Theobald Smith (Ph.B., M.D., Cornell University, Albany Medical College), 1527 O St., N. W., Washington, D. C. C. B. Michener and W. L. Williams, vouchers.

M. Stalker (M.D., V.S., Ontario), Ames, Iowa. S. Stewart, voucher.

R. P. Steddom (V.S., Ontario), Galesburg, Ill. C. E. Hollingsworth and O. J. Lanigon, vouchers.

Wm. Stinson (V.S., New York College), 59 Blossom St., Chelsea, Mass. W. Hitchcock and W. Bryden, vouchers.

G. Archie Stockwell (M.A., M.D., Albany Medical College), 650 Congress St., East Detroit, Mich. A. Liautard, voucher.

N. I. Stringer (D.V.S., Chicago), Fairbury, Ill. R. J. Withers and Geo. W. Pope, vouchers.

C. M. Stull (D.V.S., Chicago), South Bend, Ind. A. H. Baker and R. J. Withers, vouchers.

Isadore Turcot (V.S., Montreal), Minto, Walsh County, North Dakota. M. A. Piche, voucher.

E. R. Voorhees (D.V.S., Chicago), Somerville, N. J. Wm. H. Lowe, voucher.

Benj. T. Wende (V.S., Ontario), Millgrove, Erie County, New York. N. P. Hinkley and John Wende, vouchers.

Wm. B. Wertz (V.M.D., University of Pennsylvania), 4531 Lancaster Avenue, Philadelphia. R. S. Huidekoper and S. E. Weber, vouchers.

F. C. Wilkinson (V.S., Ontario), Claremont, N. H. W. L. Baker, voucher.

J. N. Wittpenn (D.V.S., American Veterinary College), 217 Whiton St., Jersey City, N. J. Wm. H. Lowe, voucher.

N. P. Whitmore (D.V.S., Chicago), Gardner, Ill. C. E. Hollingsworth, voucher.

Reinstatements.

E. C. Beckett (V.M.D., Harvard), 547 Albany St., Boston, Mass.

Madison Bunker (D.V.S., American Veterinary College), Newton, Mass.

W. S. Devoe (D.V.S., American Veterinary College), 47 Montgomery St., Jersey City, N. J. Wm. H. Lowe, voucher.

Dr. WILLIAMS: I am one of the vouchers for Dr. Theobald Smith, but it seems to me, after the discussion we have had, that his name should be held for further consideration, and I move that Dr. Smith's application be laid on the table temporarily.

Dr. CURTICE: Let me make a statement here on this question. If the Society have any objection, or if they do not care to admit him unanimously, he does not care to come in.

The motion was then stated by the President.

Dr. WILLIAMS: We may have compromised ourselves by our previous action, and I therefore think it would be just as well to lay this application on the table until the others have been acted upon, and then take up that of Dr. Smith and the question of reconsideration of our former action.

Dr. WINCHESTER: I do not think there is any analogy to be drawn there. Dr. Smith has filed his papers to become an active member of this Association. Last year he was satisfied that he was not to be admitted as an honorary member. He has taken the reins in his own hands, and I do not think there is any occasion to consult him as to whether he should become an honorary member or not. I am not in favor of Dr. Williams's suggestion.

The motion was then put by the President, and was rejected.

Dr. McLEAN: What are the qualifications required for membership?

Dr. WINCHESTER: Fill out the voucher and file your application.

The previous question was put, and the Secretary cast the ballot for Association and announced the vote.

The PRESIDENT: The Secretary will read the names of those unfavorably recommended.

The SECRETARY: There is no action required on those unfavorably recommended.

The PRESIDENT: I will now ask you to act on the reinstatement of Dr. Penniman; the Board recommends it.

On motion of Dr. Winchester, Dr. Penniman having paid his dues, he was reinstated.

The SECRETARY: The Board recommends that the following names be dropped from the roll; they are all in arrears for dues at least three years, and the By-laws of the Association allow them two years to be in arrears, but we are generous enough to allow them three years.

The following members were dropped for non-payment of initiation fee and dues:

Drs. A. S. Barnes, Maquoketa, Iowa; H. B. Boyd, New Rochelle, N. Y.; W. E. Cuff, 155 Jane St., New York City; W. D. Daniels, Cardington, Ohio; C. K. Dyer; W. J. Hinman, Winnipeg, Manitoba; C. C. Jackson, Marshall, Mo.; J. Johnstone, St. Joseph, Mo.; L. M. Klutts, Clinton, Mo.; Alex. Plummer; R. Price, 169 West Fourth St., St. Paul, Minn.; P. Quitman, 343 Wells St., Chicago, Ill.; John D. Rutherford, Aledo, Ill.; A. F. Schrieber, Sixty-first St. and Elmwood Ave., Philadelphia, Pa.; L. A. Thomas, Atlantic, Iowa; John Tillie, Muscatine, Iowa; G. W. Werner, Appleton City, Mo.; G. C. Williams, Dewitt, Iowa.

The following member resigned:

John T. Claris, 627 Clinton St., Buffalo, N. Y.

Dr. PENDRY: I heard the name of Dr. Cuff, of New York, called. Has the Secretary received any response from him?

The SECRETARY: Dr. Cuff has had mailed to him about twenty notices of his indebtedness, and not to one of them has he made any reply. In the last four years notices were sent him, calling his attention to the By-laws which apply to delinquents. He owes five years' back dues.

Dr. PENDRY: Is there any proof that he has got them?

The SECRETARY: There were return notices on the envelopes, and they never came back.

Dr. PENDRY: I move his name be laid over until the next meeting. I will see him myself. I will undertake to see the gentleman and persuade him to remain an active member, and I think he will.

Dr. ROBERTSON: He has retired from the profession and is now in the real estate business.

The motion regarding the list of names was put by the President, and carried; Dr. Pendry voting "no" in regard to the name of Dr. Cuff.

The SECRETARY: The next recommendation of the Comitia Minora

is that the seating of the newly-elected officers shall take place just prior to adjournment, and that the newly-elected President shall deliver his address before the Convention at the following meeting. It has been our rule in the past that the moment the newly-elected officers were announced they should take their seats. But now, that the work has become widespread, it is every embarrassing for the newly-elected officers to immediately take their places and carry on the work of the meeting. It is almost impossible for anybody to do credit to himself under the circumstances, and so it seems wise to adopt some such plan as this.

The recommendation was adopted.

The recommendation of the Comitia Minora in regard to the Massachusetts Association, as read by the Secretary, was adopted.

It was then voted that the resignation of Dr. John T. Claris be accepted.

The SECRETARY: The next recommendation refers to the charges against Dr. A. K. Robertson. He was before the Board, and the Board did not consider the charges sufficient to warrant his dismissal.

Recommendation adopted.

I believe that completes the report of the Comitia Minora.

The PRESIDENT: You still have before you for action the amendment to the By-laws which is offered to change the By-laws, and which you will find on the sixth page of your circulars. The Secretary will read the amendment.

Article I. reads that "any applicant for membership shall have his name proposed in writing by a member of the Association in good standing, who shall furnish evidence of the fact that he is, first, a graduate of a regularly organized and recognized veterinary or medical school; second, that he is of moral and reputable business methods."

The proposed amendment is to strike out that article except the last clause and substitute this:

"Article I. Any applicant for membership shall submit his name upon one of the Association's application blanks, duly vouched for by one or more members of the Association or by the resident State Secretary of his respective State. He shall be a graduate of a regularly organized and recognized veterinary school, which shall have a curriculum of at least three years, of six months each, specially devoted to the study of veterinary science, and whose corps of instructors shall contain at least four veterinarians. If of a medical school, a similar curriculum as to time shall prevail."

This alteration to go into effect after the annual meeting of 1892. It shall not be retroactive or apply to applicants who were college matriculants prior to its passage.

The SECRETARY: I move, Mr. President, the adoption of this amendment, and in doing so would add that I think the time has arrived for

this Association to establish in this country the highest standard of requirements for membership. I think it is quite time that we should lead, and not follow. We have had during the last six years every impracticable and unfeasible plan presented to accomplish this much desired end—all of them the result of the fertile minds of many of our members. You will recollect that at Cincinnati we discussed the formation of Eastern, Western, and Central Associations, to be controlled by a central body. Such an accomplishment was beyond our powers to achieve, and will never succeed in this country. You had again the discussion of the National Board of Examiners. It came up every time with some new trimming. In the face of State laws you cannot create a National one which will cover this ground or solve this question. You had before you, for three years, another plan; and I can only recall the active work done by the second member of that committee on what is known as the Central Organized Body. You all know how elaborately he placed before you his plan; with what strength and force he brought the convincing argument to our minds that this should be the plan to solve this knotty question, and to be the acme of success for our profession; and when, at last, that committee was done away with, the sighs that emanated from the breast of our friend from New York could be heard back in Washington. So went the Central Organized Body, and so has gone every other plan which has been offered, from time to time, for your consideration, while the one plan by which we could solve this question was left unthought of and unacted upon. This act, to go into effect after this meeting, needs no machinery. It carries with it all that is necessary to make it forcible and active. It does not revert back to a discretionary board, who may construe it as they like. It is fixed; immovable, unless changed by amendments to our By-laws; and for these reasons I recommend its adoption.

Dr. R. A. McLEAN: As the seconder to this motion to our By-laws, I can hardly say more than our Secretary has done. There is one point I think it well to dwell upon for a moment, and that is that this will, in my opinion, strongly tend toward the much-needed higher standard of education in our schools. It is daily becoming more evident that membership in the Association is something that is to be sought after. Before, we used to go into the highways and byways, and buttonhole men to join us. Now they are writing to us from all over the country, asking to become members. We are not asking them to join us; we are simply lifting ourselves a step higher and making our requirements a little more difficult to attain. I certainly hope that the amendment to the By-laws will go through with the hearty accord of the meeting.

Dr. LIAUTARD: I wish to state that this requirement will take effect in 1892, and there will be quite a number of good men who expect to graduate, according to the requirements of their schools, after a two

years' course. What is to be done with these men? It will debar a number of good men.

Dr. R. A. McLEAN: In reply to the gentleman from New York, allow me to call your attention to the fact that this amendment has been widely published for two years. Now is the time to act. "It shall not be retroactive nor apply to applicants who were college matriculants prior to its passage." It might as well be put over until 1894, if not acted upon now. It has been widely advertised to the public in all the journals three or four times over.

The SECRETARY: I would like to state that in drawing that amendment it was not intended to operate against the ones who would matriculate in 1892, or apply to them. I think the Comitia Minora would so consider it.

Dr. PENDRY: While it has been widely published, it is nevertheless the fact that it has never been acted upon, and many will matriculate who did not know that it was going into force. I think it is a step in the right direction, but I do not think it will do to take so sharp a turn. The point I wish to make is this, that it shall not take effect until the 1st of January, 1893. It will then be known as a fact, not as contemplated, but as a law.

Dr. McLEAN: This is no force bill, Mr. President.

The SECRETARY: It certainly is not the intention of the Board to make it applicable to those who enter this year. If you think the wording of it ought to be changed, I think it will probably be acceptable to those who favor its passage not to apply it to those who matriculate in 1892. While it was to go into effect at this time, it certainly was not meant to operate against those who matriculate in 1892.

Dr. McLEAN: I accept Dr. Pendry's amendment.

The motion was put and carried as amended.

The Convention adjourned until 2 o'clock P.M.

Afternoon Session.

The PRESIDENT: The first order of business is the Report of the Committee on International Meeting, which the Secretary will read.

International Committee Meeting.

R. S. Huidekoper, President, presiding.

The following members were present: Drs. Huidekoper, Liautard, Hoskins, Schwartzkopff, and Williams.

Absent: Drs. Salmon, Baker, Stickney, and Clement.

Drs. Liautard reported a draft of letter of contributing membership of \$2.

Your committee would recommend that the session convene for four days.

Your committee recommends that an invitation be extended to a delegate of each National Veterinary Association, or representative of a national veterinary body of Europe, with the offer of a steam passage to and fro free, to be paid by the Association.

Dr. Williams moved to adopt recommendations, seconded by Dr. Schwartzkopff. Carried.

Organization: International Committee to appoint a committee as special reporters to present three subjects on international topics of interest, to be considered and discussed. Carried.

Subjects to be considered: Tuberculosis, Animal Food Supply, and Veterinary Education.

It was moved and carried that a special assessment of \$5 be levied on each member to defray the extraordinary expenses.

Your Committee recommends that it be called, in addition to the Thirtieth Annual, the First International Veterinary Congress of America.

A motion to adjourn until 7.55 P.M. was carried.

W. HORACE HOSKINS,
Secretary.

DEAR SIR AND CONFRÈRE: At the occasion of its anniversary, and in connection with the International World's Fair, the United States Veterinary Medical Association has decided to hold its thirtieth anniversary meeting at Chicago on the third Tuesday of September, 1893.

The Committee of Arrangements hereby beg to call the attention of our colleagues in Europe to the event, in which important subjects relating to our profession and to international veterinary science will be presented and discussed, with the hope that some of them will have their names entered as honorary members at the meeting, and may find it convenient for them to visit us on this occasion.

Application to be mailed by letters to Dr. W. Horace Hoskins, Secretary, 12 S. 37th St., Philadelphia, Pa., with the remittance of \$2, which will entitle them to a copy of the *Transactions* of the meeting.

On motion, the report was received.

Dr. R. A. McLEAN: Is it necessary that members of this Association should pay two dollars to be present?

The PRESIDENT: No; only outsiders.

Dr. R. A. McLEAN: I beg to move that that section be adopted, with the exception of the last clause. If we are going fishing to get delegates to come here, and offer to pay their fare to and fro, very well. But if this Association is so wealthy that it can find no more profitable field than this in which to spend its money, I would like to know it. When we sent a delegate to the Brussels Congress his expenses were

paid, and it was with the utmost urging that he could be induced to accept his fare, and I am not certain that he did accept it. We cannot very easily pay eight or ten men to come at an outlay of \$150 for each delegate. I believe it would be an insult to those European bodies.

Dr. CURTICE: Is there any reason why we should pay their expenses?

Dr. LIAUTARD: The idea of the committee was to send an invitation to those members in Europe whom we might call professional representatives of national bodies. We might ask these bodies to appoint delegates to be here as their representatives, and our idea was to send them, as an appreciation of their appointment, passes, not from London, not from Paris or Bremen, but from the port where they start to the point here where they would land, in Boston or New York, merely as a matter of compliment, and not as a bait for them to come. The pass was not to be sent to them until their appointment as a delegate was made known to us. You may say it is a queer thing for us to pay for these passes, and what is the benefit of it? We want to have a few of those big men from the other side here, and a few hundred dollars spent in this way would certainly bring a great deal of good to our Association. That was the idea of the suggestion.

Dr. SALMON: It strikes me that this is an unprecedented step for the Association to take. Certainly no European Congress has ever offered to pay the expenses of delegates from this country, from our port to theirs, and in most cases even the courtesies shown have been rather scant. Now, I should prefer to spend our money in showing courtesies to the delegates who come to this country. We should want some dinners and excursions, and should want to pay the expenses of all the delegates who went on these excursions or attended these dinners. I know the International Congresses held in England have not gone so far as to give the members free passes on the excursions they gave as courtesies to the members. Now, I do not believe in conducting an international meeting in that way. We must show a great many courtesies, and would probably spend a great deal of money in giving them a chance to see the different things of interest in this country which they would want to see, and giving them free excursions on a liberal scale. I do not think we would get many more delegates by paying their expenses over here than we would by getting up an attractive programme in the way of courtesies after they arrived.

Dr. LIAUTARD: I do not believe we would get any more by offering them their passage. You understand, this free passage is not a temptation for gentlemen to come. They know nothing about this until they get their appointment.

Dr. HOSKINS: That matter has been gone over very thoroughly by the committee, and it has been recommended that the delegates from the foreign countries reaching New York would be entertained there for

a time, and then they might gravitate to Pennsylvania, and they would be taken care of there and in the West. In fact, it was proposed that we should take care of them in that way clear to Chicago; so that this, it was thought, would be a means of making our Congress a greater success, and establishing our importance as a centre of veterinary science in the world, and I think we can well afford to adopt the suggestion.

Dr. R. A. McLEAN: If this goes through and it becomes known, in the edition of the *Oshkosh Sun* will appear a paragraph reading "Dr. Liautard will have a surprise party for every one coming. This is going to be a regular surprise party to them." It is all bosh!

Dr. L. McLEAN: Is there a limit to the number of delegates to be invited?

The PRESIDENT: Yes.

Dr. L. McLEAN: How many?

The PRESIDENT: Probably eight to ten. They do not exceed that number.

Dr. L. McLEAN: Then I move that they be our guests while here, and we defray their expenses here.

Dr. R. A. McLEAN: I move that the last section be adopted, with the last paragraph struck out.

Motion seconded by Dr. Salmon, and carried.

Dr. R. A. McLean offered a motion that diseases of swine be one of the subjects for special consideration, but, as it was part of the subject of animal food, the motion did not prevail.

The following reports were then read, and discussion of the papers was postponed until to-morrow morning.

Committee on Intelligence and Education, by Dr. Peters.

Committee on Diseases, by Dr. Clement.

Committee on Army Legislation, by Dr. Kilborne.

Committee on Food Inspection, by Dr. Schwartzkopff.

Report of Publication Committee, by Dr. Hoskins.

Report on Meat Inspection, by Dr. Bryden.

Report of the Secretary, by Dr. Hoskins.

Reports of State Secretaries.

Dr. Salmon, for the Committee on Prizes, reported that the committee had no report to make.

Committee on Finance postponed their report until the Treasurer's Report was in.

Adjourned until Wednesday 9.30 A.M.

SECOND DAY.—*Morning Session.*

The meeting was called to order at 10.15 A.M. On roll-call the following members were present: Drs. Ackerman, Allen, Bates, Bryden, Claris,

Clement, Curtice, William Dougherty, Eves, Faville, Frinck, Goentner, Hall, Hitchcock, Hoskins, Howard, Huidekoper, Huntington, Kilborne, Labaw, Liautard, Lowe, R. A. McLean, F. W. McLellan, Nesbitt, W. B. Niles, Osgood, Paige, Pendry, G. P. Penniman, Peters, Peterson, James B. Rayner, A. K. Robertson, J. L. Robertson, Salmon, R. J. Saunders, J. S. Saunders, Schwartzkopff, Sherman, Stewart, Stickney, Walrath, W. L. Williams, and Winchester.

After roll call and the report of the Comitia Minora was submitted, President Huidekoper introduced Dr. Pepper, Provost of the University of Pennsylvania, who briefly addressed the Convention.

ADDRESS OF DR. PEPPER.

MR. PRESIDENT AND GENTLEMEN: I happened to be passing through Boston on private business, and met Dr. John Marshall, Dean of the Veterinary Department of the University of Pennsylvania, who showed me a telegram signed by Dr. Pearson, in which the very deeply interesting statement was made that this body had indorsed a compulsory three-year curriculum of veterinary education, with such conditions and to go into effect at such time as may seem wise to you; but the step has been taken. I am sorry to say that I am one of those who graduated in medicine in two short years of education; and I have lived long enough to get over the feeling, not exactly jealousy, more envy, that I see the young men of to-day so vastly much better educated in medicine than I was myself, and to see to-day that the medical schools of the country are placing themselves, strongly, upon a four-year curriculum with the approval of the profession, the support of the public, and the recognition that nothing less than this can give any man a thorough mastery of scientific or medical knowledge. Talking with that Nestor of your profession, Dr. Liautard, this morning, and asking of his early experiences in the veterinary profession when he first entered its ranks in this country—and we all know what he has done for veterinary medical science and education in America—I found that there were then none in your profession with degrees from scientific schools.¹

It is no disparagement to those men, it is no disparagement to my predecessors in medicine, but we cannot shut our eyes to this enormous march of science, of exact scientific knowledge, and as each branch of the profession wheels into line and joins in the army of progress in this

¹ In the address made by the Provost of the University of Pennsylvania he made a statement that previous to the year of Dr. Liautard's coming here there were no qualified veterinary practitioners in the country. He wishes to correct this statement, and say that there were such graduates of scientific schools as Drs. Budd, Curtis, Dixon, and Grice, in Boston; Dr. Pilgrim, in New York; Dr. Lilliman, in Boston; and Dr. Cuming, in St. John's, New Brunswick.—Communication from J. H. Stickney.

country, it fills those of us of an older day, who have been working in the cause for a good many years, with pride, with delight at seeing the profession swelling and strengthening constantly.

I congratulate this Association, Mr. President, and you, personally, whose whole-hearted interest in scientific veterinary education is known to the entire country, that it is under your administration this year; and also I congratulate the whole Convention upon the fact that this step was taken. It will elevate your profession and dignify it. It will enable the young men to go out and cope with the huge questions that they meet with in practice and in dealing with the great work which they have to perform. I congratulate you that you show yourselves willing, at a sacrifice, to place yourselves upon this advanced position. It shows that you merit the approval of the community, and insures a continuance of it. I am glad to have been here this morning and to have had an opportunity of presenting my respects to you, and I again congratulate you upon the forward position you have taken here.

The PRESIDENT: The next order of business is the discussion of reports. The report of the Committee on Intelligence and Education. You have also Dr. Peters's report of last year unfinished, and a new report offered this year is before you for discussion. (See Reports.)

The CHAIRMAN: The Report on Finance was submitted and read by the Secretary.

James L. Robertson, Treasurer, in account with the United States Veterinary Medical Association.

Balance on hand, September 16, 1890	\$703 43
Paid Bennett, Edwards and Pettit, stenographers	\$81 50
October 1, 1890, paid R. S. Huidekoper, Committee on Legislation	166 50
	<hr/> 248 00
	\$455 43
In hands of Secretary,	263 04
	<hr/> \$718 47
In Treasurer's hands	\$9 25
Received from Secretary	86 81
	<hr/> \$46 06

Approved,

R. A. McLEAN,
THOMAS B. RAYNER,
AUSTIN PETERS.

James L. Robertson, Treasurer, in account with the United States Veterinary Medical Association.

Balance on hand Sept. 1, 1891	\$492 24
Received from Secretary, per approved account	263 04
Money in hands of Secretary, per following statement:	
Receipts Sept. 15, 1891, to Sept. 19, 1892	\$690 00
Disbursements Sept. 15, 1891, to Sept. 19, 1892	687 13
Balance due Treasurer	\$2 87
	<hr/>
	\$758 15

THOMAS B. RAYNER,
CHARLES T. GOENTNER,
R. A. McLEAN.

The PRESIDENT announced that the discussion on the Report on Diseases was in order. There was no debate upon the report. (See Report.)

The report of the Committee on Army Legislation was next read.

Dr. CURTICE: I would like to say something about army legislation. I do not know the nature of the bill which it is desired to pass. I was one of the minority. Mr. Jellison, of that committee, followed up the legislation in the Senate chamber, and should be rewarded by the Society for his efforts. The difficulty of getting a law passed by this Society, or any society, is not insuperable, but it is very great. The trouble, it seems to me, is not in accepting things as they are. There should be an organized corps of men to look out for the welfare of any bill in the future, in order to insure anything being done. The committee which appeared before the House and Senate ought to have more than the heartfelt thanks of this member and that member in getting their support.

The PRESIDENT: The report of the Publication Committee. (See Report.)

Dr. WILLIAMS: I think comparatively few of the members of this Association know the organization of this committee. If the Secretary will state who constitute it he will inform a good many of us.

The PRESIDENT: It is one of the regular committees of the Association, appointed, as all other committees are, by the President, and consists of Drs. Hoskins, Weber, and Kooker. They have charge of the papers of this Association. You will see in the Constitution what this committee is for, and in our printed book which is before you.

Dr. WILLIAMS: I think, gentlemen, we have reached the stage in the organization of our Association where we should put this committee into active work and get reasonable work from them, and we should have a brief report of our proceedings, papers, discussions, etc., to be given into the custody of this Committee on Publication; and I move

that they be instructed to obtain not less than 500 copies of the complete proceedings of this meeting; and I would add also the proceedings of the last meeting, to be incorporated in one volume.

The SECRETARY: There were 300 or 400 copies of last year's report obtained and delivered. These were the stenographer's report of the meeting, and that is as fully as we were able to carry it out.

Dr. CLEMENT: The report of the last meeting was not printed. I should think it would be a good idea to have these transactions printed and sold to the members for a price on subscription.

The PRESIDENT: You have before you the proposition of Dr. Williams that the proceedings be printed to the extent of 500 copies.

This motion was put and carried.

The next report in order was that of Food Inspection. (See Report.)

The PRESIDENT: Gentlemen, applications for honorary membership are now in order.

The SECRETARY: I desire to offer for honorary membership in this Association the name of a man who was one of the early organizers, or one of the earliest members, and whose name, from no fault of his, was allowed to slip from the roll. There was no lack of interest on his part, no lessening of his zeal in the work of his profession, no decrease of ardor or decrease in the amount of routine work performed, more, perhaps, than any one man in the United States. It is the name of one who for sixty long years has labored in the routine of the profession, day in and day out; one who has made our profession in the State of Pennsylvania an honored one, who has raised it in dignity and in the appreciation of the people in the eastern portion of Pennsylvania and in the western portion of New Jersey more than any number of others. He has no medals, or degrees, or foreign decorations, or anything of that kind, but he has something equal to all that; he has sixty long years of practice among the people who honor and love him. Now, the last few years of his life are drawing to a close. I offer, gentlemen, the name of Dr. Isaiah Michener, who was born in 1812. Dr. Michener was one of the first members of the profession to recognize and treat the disease "cerebro-spinal meningitis," and I ask of you, on the grounds of his advanced years and on account of the narrow thread which now binds him to this life, that you suspend the rules and elect him by acclamation. I ask for unanimous consent on the suspension of the rules, that this name may be offered, so that we may act on it to-day, and not take the chances of what another year may bring forth.

Dr. RAYNER: Dr. Michener has been an old practitioner. He is a man that I think a great deal of on account of his eminence in the profession. I have listened to his lectures, as many others have done, and I know that he is a whole-souled veterinary surgeon. He does not seem to know else than generosity, and I think that the conferring of honor-

ary membership upon him would not only be a source of gratification to the old gentleman, but it would be a great honor to our Association to accept such a man in the profession as Dr. Michener. Let me add that I feel very proud to second the motion to make him an honorary member of this Association. I hope it will be carried unanimously.

The PRESIDENT: Before the motion is put I desire to say a word as to the international character of our meeting next year. And here let me say that there is one name which stands pre-eminent, and which should have been put upon our rolls as that of an honorary member before this time; a man whom you all know as one of the greatest physiologists; a man who has done a vast amount of work in the study of contagious diseases, especially as some years ago he finished his work. I name Dr. Chauveau, Director-General of the Veterinary Schools of France. I should like to ask a special vote to enable us to elect this distinguished man as an honorary member.

Dr. LIAUTARD: It was my pleasure, Mr. President, to ask for the suspension of the rules in favor of the election of other gentlemen, and I think there are two other men whom you will consider as worthy of that distinction, men who are working in the interest of our profession and the advancement of all science. They are Prof. E. Nocard, of Alfort, and Dr. Arloing, Director of the Toulouse Veterinary School. I hope these gentlemen will receive that distinction. No doubt they will be flattered with our choice, and our Association will gain by having them in our list of membership.

Dr. SCHWARTZKOPFF: As we have under consideration for honorary membership the names of some foreign representatives of our profession, I think I ought to nominate one or two of the German professors, such men as are well known in our ranks and whose work and character will command the respect of all. I think, in reviewing the distinguished names in veterinary science, these two will commend themselves to our brethren, Prof. Dieckerhof, of Berlin, and Prof. Friedberger, of Munich. Prof. Friedberger is the author of the book on *Special Pathology*.

The PRESIDENT: I would call your attention to our Constitution, which limits us to three names. We have elected Dr. Welch, and we have the names of Drs. Michener and Chauveau. We can only elect two of the others.

Dr. SCHWARTZKOPFF: I was not aware of the constitutional limitation.

Dr. R. A. McLEAN: I call for the question on the original motion.

The question was put, and Drs. Michener and Chauveau were elected honorary members.

The election of the officers of the Association was announced in order.

The PRESIDENT: The next order of business is the election of officers.

Dr. R. A. McLEAN: Those of us who attend the meetings know how

much a certain member of our Association has done to advance its interests in the boundless West, and as we expect to go there to be entertained next year and to entertain others, I think it will not require any fulsome speech from me to secure your votes for Dr. Williams, of Indiana, for President.

Dr. WINCHESTER: I nominate Dr. Clement for President.

This nomination was seconded by Dr. Peters.

Dr. BRYDEN: I think if we owe anything to anybody we owe it to the members from the West, and we ought to keep on good terms with that section of the country. We were informed two years ago that the officers should be put in training, and I think we ought not to shift around from that suggestion, and if the East shows any want of courtesy to the West, we will make a very great mistake. If our present President declines the office, I think the nomination belongs to the West, and I favor Dr. Williams.

Drs. Rayner and Eves were appointed tellers by the President, and the result of the vote was the election of Dr. Williams by thirty-two votes, Dr. Clement receiving twenty-three.

On motion of Dr. Clement, seconded by the Secretary, Dr. Williams was declared unanimously elected.

The President then announced that by the courtesy of the Massachusetts Association, the members of the Association were invited to attend the Park Theatre that night, the tickets for which would be distributed on the boat during the afternoon excursion.

Dr. R. A. McLean nominated Dr. Peters, of Boston, for Vice-President, which was seconded by Dr. Lowe.

Dr. Pendry nominated Dr. Clement.

The result of the vote was Dr. Clement's election, he receiving forty votes and Dr. Peters fifteen.

On motion of Dr. Peters, Dr. Clement's election was made unanimous.

Dr. James L. Robertson, of New York, was chosen Treasurer by acclamation.

Dr. Lowe nominated Dr. Hoskins for Secretary.

Dr. HOSKINS: I feel that the Secretaryship should go somewhere else. My business interests are such that they demand that I should give my whole attention to them. The office of Secretary is exceedingly burdensome, and I do not like to accept it for another year. I should prefer to have my name withdrawn in favor of some one else. Certainly there is some one who is capable of taking up and carrying on this work.

The PRESIDENT: You have heard the remarks of our Secretary. Dr. Hoskins says that positively his duties will not allow of his acceptance of the office.

Dr. SALMON: It seems to me, Mr. President, that it would be a most inopportune time for the Secretary to decline the office. He has been

so long familiar with the Association that it certainly would be a great damage to its interests for a new Secretary to be appointed for the ensuing year, when so much depends upon him for the success of the meeting we are to have at Chicago. I feel sure that although we all know how much work it involves, we are entirely of the opinion that he should accept it again. We know he has the interests of the Association so much at heart that he will not decline to serve for the coming year, when we all feel that every effort should be made to make the next meeting successful. I hope for this reason that Dr. Hoskins will reconsider what he has said about not being able to take the office for another year, and will allow his name to run and allow us to have his services, which are so valuable to us and so necessary to our success.

The PRESIDENT: I would state here that I agree perfectly with Dr. Salmon. I know that during the last few months Dr. Hoskins was obliged to purchase a type-writing machine in order to do the work incumbent upon him, and if we insist upon his taking the office we must certainly furnish him with a clerk for the coming year to do the detail work. I will therefore suggest that in asking him to accept the position, we should pay a clerk that he may employ. I know the amount of time it takes to attend to the correspondence, the letters running at times from a few up to fifty, while the sending out of circulars and the management of details consumes a vast deal of time, not only in supplying our own members with notices and information, but many outsiders who make inquiries.

A motion was then made that the Secretary be given authority to employ a clerk, which prevailed.

Dr. Hoskins was then elected by acclamation.

The Secretary gave notice that three applications were on file for membership, and that the Comitia Minora would meet at half-past nine on Thursday morning to consider them.

A motion to adjourn to meet at 10 A.M., Thursday, was carried.

THIRD DAY.—*Morning Session.*

The Convention assembled at 10 A.M. On roll-call the following members were present: Drs. Ackerman, Allen, Bates, Bigelow, Brenton, Bryden, Clement, Curtice, William Dougherty, Eves, Faville, Frinck, Goentner, Hoskins, Howard, Huidekoper, Huntington, Kilborne, Labaw, Liautard, Lowe, Lyford, Lyman, McLaughlin, R. A. McLean, F. W. McLellan, Nesbitt, W. B. Niles, Osgood, Paige, Pendry, Peters, Peterson, Purcell, J. B. Rayner, J. L. Robertson, Salmon, Fred. Saunders, R. J. Saunders, J. S. Saunders, Schwartzkopff, Sherman, Stewart, Stickney, W. L. Williams, and Winchester.

After roll-call the recommendation of the Comitia Minora was taken up.

Dr. Bunker was reinstated, and Drs. Wilkinson, Smith, and Gadsden were admitted to active membership.

The resolution with reference to amending the By-laws regarding honorary membership was adopted.

The SECRETARY: It is my painful duty to announce the news of the death, since our meeting here in Boston, of one of our members, the only member we had in the State of Kentucky, Dr. James L. Kidd. He was one of the youngest members of our Association, and at the same time one of the most active and efficient. I move that a committee be appointed to draft suitable resolutions in respect to his memory.

The President announced that a committee was already appointed to do such work, Drs. McLean, Williams, and Stickney, and they were empowered to draw up resolutions on the death of Dr. Kidd.

The Secretary's notice of the resignation of Dr. John T. Claris was submitted and accepted.

The President having announced that new business was in order, the Secretary read the charges against Drs. Lyford and Berns.

Referred to the Comitia Minora.

Whereas, We, the undersigned members of this Association, desire to call your attention to the violation of our Code of Ethics, being committed by two of our members in the patenting, dealing, and advertising of specialties of a professional character. We refer to the names of George H. Berns, Patent Fomentation Pads, and Dr. C. C. Lyford, Patent Impregnators; and we further request that this Association direct their Comitia Minora to investigate the said violations and report to this Association.

J. F. WINCHESTER,
THOMAS B. RAYNER,
L. MCLEAN.

The Secretary brought up the matter of gold medals as prizes.

The President suggested to refer it to the Prize Committee.

I beg to move that the United States Veterinary Medical Association annually appropriate not less than \$150, to be awarded in gold medals as first and second prizes to the graduates of the year from any recognized veterinary school in the United States passing the best and second best practical examination; and that a committee of three be appointed by the President to conduct said examination, the disbursements of said committee to be paid by this Society.

L. MCLEAN, M.R.C.V.S.

Dr. R. A. McLean reported resolutions in respect to the memory of Dr. Robert Wood, of Lowell, Mass., to which were added those of Drs. Bridges, Atkinson, and Kidd, all of which were adopted.

Whereas, Almighty Providence has seen fit to take from among us by death, Robert Wood, V.S.; and whereas, he has, as one of the oldest members and organizers of this Association, ever proven himself an estimable gentleman,

an earnest, conscientious worker for the elevation of, and a high honor to our profession :

Resolved, That we, members of the United States Veterinary Medical Association, recognize in his death a keen sense of loss to our profession and to this Association. His death touches us still more deeply as a personal friend, whose loss we shall ever deplore, and whose example in life we shall strive to emulate ; and

Resolved, That a copy of these resolutions be spread upon the records of our Association, and that copies of the same be furnished to the *Journal of Comparative Medicine* and the *American Veterinary Review* for publication.

Whereas, Almighty Providence has seen fit to take from among us by death, George Bridges, D.V.S. ; and whereas, he has, as a member of our profession and Association, ever proven himself an estimable gentleman, an earnest, conscientious worker for the elevation of, and a high honor to our profession :

Resolved, That we, members of the United States Veterinary Medical Association, recognize in his death a keen sense of loss to our profession and to the Association. His death touches us still more deeply as a personal friend, whose loss we shall ever deplore, and whose example in life we shall strive to emulate ; and

Resolved, That a copy of these resolutions be spread upon the records of our Association, and that copies of the same be furnished to the *Journal of Comparative Medicine* and the *American Veterinary Review* for publication.

Whereas, Almighty Providence has seen fit to take from among us by death, V. T. Atkinson, V.S. ; and whereas, he has, as a member of our profession and Association, ever proven himself an estimable gentleman, an earnest, conscientious worker for the elevation of, and a high honor to our profession :

Resolved, That we, members of the United States Veterinary Medical Association, recognize in his death a keen sense of loss to our profession and to this Association. His death touches us still more deeply as a personal friend, whose loss we shall ever deplore, and whose example in life we shall strive to emulate ; and

Resolved, That a copy of these resolutions be spread upon the records of this Association, and the same be furnished to the *Journal of Comparative Medicine* and the *American Veterinary Review* for publication.

Whereas, Almighty Providence has seen fit to take from among us by death, James L. Kidd, D.V.S. ; and whereas, he has, as a member of our profession and Association, ever proven himself an estimable gentleman, an earnest, conscientious worker for the elevation of, and a high honor to our profession :

Resolved, That we, members of the United States Veterinary Medical Association, recognize in his death a keen sense of loss to our profession and to this Association. His death touches us still more deeply as a personal friend, whose loss we shall ever deplore, and whose example in life we shall strive to emulate ; and

Resolved, That a copy of these resolutions be spread upon the records of our Association, and the same be furnished to the *Journal of Comparative Medicine* and the *American Veterinary Review* for publication.

The PRESIDENT: I have, gentlemen, a communication from Dr. Stickney which, if you have no objection, we will instruct the stenographer to add to the report of yesterday's proceedings. In the address delivered by the Provost of the University of Pennsylvania he made the statement that previous to the year of Dr. Liautard's coming here there were no qualified veterinary practitioners in this country. He wishes to correct this statement, and say that there were such graduates of scientific schools as Drs. Budd, Curtis, Dixon, and Grice, in Boston, Dr. Pilgrim in New York, Dr. Lilliman in Boston, and Dr. Cuming in St. John's, New Brunswick.

We will now proceed to the reading of the papers.

Dr. SALMON read his paper on "The Scientific Investigations of the Bureau of Animal Industry," illustrating it by photographs.

Dr. PETERS moved that the paper be discussed now, and the motion was seconded. He said: I have no desire to trench on any custom of the Association. I simply wish to say something in my own behalf. In listening to Dr. Salmon's paper I came to the conclusion that perhaps something had been said by me, unintentionally, in criticism of his department, and I am very happy to say that I had no intention of doing anything discourteous, and regret that anything I said in my report of last year partook of such a personal character as Dr. Salmon views it. I agree with Dr. Salmon in what he said yesterday, that one member of this Association should not make such personal remarks about another. "If he has anything to say about his professional character or standing, he should bring it forward as charges against a man and not in a report or paper." At the same time, there are two sides of the question. I am sorry that anything I said should create any bad feeling, and I acknowledge that it was a mistake to be so personal in what ought to have been an entirely argumentative sort of paper.

Dr. SALMON: Mr. President, as the other party to this controversy, will you allow me to say that the very manly remarks made by Dr. Peters removes all cause of difference between us, and there is no reason why we should not be friends in the future. I should be very glad to welcome any criticism on the scientific points of the paper just read. I am always glad to have it, and in such a discussion, if I cannot hold my own, I am willing other people should get the benefit. I again express my gratification at the remarks which Dr. Peters has made.

The SECRETARY: I would like to make one remark at this time. There seems to be a misunderstanding on the part of the members of this Association in regard to committee reports. In the minds of some there seems to be an idea that we indorse reports read here. We do not do anything of the kind. We simply receive and file them, and from these reports draw our own individual conclusions. I think it is well to have this understood by all members, because it might be thought that the

Association upheld and supported and indorsed whatever their committees said.

Dr. LOWE: As a member of the Association, I would like to know exactly what we indorse and what we do not indorse. This is supplementary to the remarks of Dr. Hoskins. I think this Association attaches a great deal of importance to and values very highly the scientific investigations of the Bureau of Animal Industry, and I do not think we should be put down as indorsing what we do not indorse or condemning what we do not condemn. It has gone out broadcast that this Association has condemned certain scientific work of the Bureau of Animal Industry. I do not think that the Association does anything of the kind, and I should like to see the matter fully discussed now that it is brought out by the various investigators, and I think there are several present. If this matter is in the hands of the committee, not the Association, I should like to make a motion that it be referred back to that committee to give further consideration to it and report to us.

Dr. CLEMENT: I rise to a point of order. I think the papers are before us for discussion, not for indorsement or condemnation.

Dr. McLEAN: I think that was very well covered by the Vice-President of the Association when he said to approve or condemn was out of the question.

The PRESIDENT: I will decide that the motion to refer back to the committee is in order, and the paper may be referred to the Committee on Intelligence and Education.

Dr. PENDRY: We cannot refer this paper back because it is now in the hands of the Convention.

Dr. CLEMENT: I do not think that the motion is in order.

The PRESIDENT: It has not been seconded, and it is out of order, as worded by Dr. Lowe, although I may have misunderstood his possible meaning.

Dr. McLEAN: I move that the discussion of this subject be deferred until we are prepared. When it is printed and delivered to every member of the Association we may come to some proper conclusion.

Dr. PENDRY moved to postpone the discussion and refer it to the meeting in Chicago next year.

Dr. FAVILLE, in seconding Dr. Pendry's motion, said: I do not think I would be competent to discuss this matter. I think it is best to close the discussion at present and defer it until we have studied up the subject.

Dr. CURTICE: That question will be hashed and re-hashed in our periodicals long before 1893, and it will give way to other matters of great importance which will come up at the Chicago meeting.

Dr. FAVILLE thought that the Convention was not prepared to discuss the question at the present time, and said: "Perhaps we shall all be

better able to consider it intelligently after it has been re-hashed in the public prints."

Dr. CURTICE: This question is occupying men who are interested in it now. We should be simply consuming time, and I do not see how we are to gain anything by not taking it up at this moment.

Dr. BUNKER: It seems to me that the discussion of this paper at this time is utterly impossible. There are in this gathering, this morning, members who are personal friends of Dr. Salmon and personal friends of Dr. Peters. This matter has gone beyond the scope of scientific research, to a certain extent, and there are members of this Association who are capable of becoming convinced either one way or the other; and to undertake to discuss that paper this morning with any degree of fairness either to Dr. Salmon, to Dr. Peters, or to ourselves is, to my mind, entirely beyond our capabilities. These papers are to be published in the record of our proceedings; they are to be presented to each member of this Association for his consideration and for mature deliberation and decision, and it certainly seems to me that to give this matter a candid discussion and candid treatment, and to treat these two gentlemen who claim, and rightly claim, to be investigators, making no comments on the accuracy of their work, but to give these two gentlemen the consideration which their work deserves, it seems to me that the discussion now is utterly impracticable, and if we do have a discussion on it, even if the meeting at Chicago is a year from now, the matter is sure to be kept alive, and we shall be more capable of properly treating it. Our sympathies are some of them for Dr. Salmon and some for Dr. Peters, who has made this retraction, and it seems that the discussion of this paper is proper at Chicago and not at Boston.

Dr. McLEAN: The authority that made the routine has declared that certain things shall not go on at certain times.

The PRESIDENT then decided to defer the discussion on the subject.

Dr. WINCHESTER read his paper on "*Strongylus Armatus*."

Afternoon Session.

The Convention met at 3 P.M.

Dr. WILLIAMS, of Indiana, read his paper on "Veterinary Science in Agricultural Colleges and Experiment Stations."

Dr. F. L. KILBORNE read his paper on "Mallein for the Diagnosis of Glanders in Horses."

Dr. GADSDEN read his paper on "Our Duty to the Cattle Interests of the Country."

The SECRETARY read a telegram from Dr. Wyatt Johnston, saying that he had been called to the quarantine at Grosse Isle and could not be present at the Convention.

The SECRETARY then read Dr. Johnston's paper on "A Form of Tuberculosis."

Dr. BUNKER: I would like to offer a resolution at this time which I trust will meet the ideas of the members of this Association, and that is the resolution expressive of the appreciation of the work of the Bureau of Animal Industry at Washington.

Resolved, That the members of the United States Veterinary Medical Association here assembled at the annual meeting, desire to express their appreciation and confidence in the work and efforts of the Bureau of Animal Industry for the advancement of veterinary science, the promotion of the agricultural interests of the people and the elevation of the veterinary profession, and that the thanks of this Association be extended to the chief of that Bureau and his assistants for their efforts.

The motion was seconded by Dr. Gadsden, and the resolution was adopted as read.

Dr. FAVILLE: I would like to offer a resolution that in the future members preparing papers to be read shall prepare a synopsis of such papers for submission to the Comitia Minora, by them to be referred to two members of the Association, who shall be recognized leaders on the subjects of the papers; and that the papers shall be limited in the length of time of their reading to thirty minutes, in order to admit of discussion at the time of their submission to the Convention.

The PRESIDENT stated the motion.

The SECRETARY: It seems to me, Mr. President, that you could hardly draw the line on some of the papers at half an hour. It is certainly too short to prepare a *résumé* of the papers offered us to-day. Would it not be better that we should convene promptly at the hour of meeting each morning, and not lose so much time gathering, so that we may have time to devote to the reading of these papers and the subsequent discussion of them.

Dr. FAVILLE: In the resolution I did not intend to limit these papers except in the length of time we should occupy in the reading unless permission is given by the Association for an extension of the time. But the idea is to cut these papers down to thirty minutes, to have the synopsis furnished so that the two men who are leaders in the discussion may know all the points in the papers and be able to treat them instructively.

The SECRETARY: It seems to me we ought not to adopt that motion in just that form. Perhaps it would be better that it should be referred to the Comitia Minora.

Dr. CLEMENT: Here are papers left over from last year, and quite a number left over from the Chicago meeting which have not been discussed. Now, it seems to me that the members of this Association who read papers could just as well limit them to thirty minutes. A paper

can be nothing more than a synopsis at a meeting of this kind. It could be "boiled down."

The SECRETARY: It seems to me that we should rather yield up less time to minor matters. No one regrets the yielding of half a day to the Massachusetts Veterinary Association, but when we laid out this programme it was not considered that it would consume so much time. In the future we shall have to arrange it so that entertainment of that sort shall not interfere with our proceedings.

Dr. FAVILLE: I appreciate what the Secretary says, and I presume I for one have not been on time; but, nevertheless, a discussion will take up considerable time. In some of the papers submitted to-day points have been brought out that we would like to hear discussed.

The SECRETARY: Fifteen minutes were lost at noon to-day, and an hour and a half this morning.

Dr. PENDRY: I am heartily in sympathy with the original resolution introduced here. I do not see why the worthy Secretary should hammer us as he has been trying to do.

The SECRETARY: I am speaking of the officers being interrupted.

Dr. PENDRY: I do not think that the proceedings have been interrupted by the officers.

The SECRETARY: I think the meetings should be called at 9 A.M. sharp, and if that is done it will allow more time for discussion. I still ask for reference of that matter to the Comitia Minora.

The motion was carried upon a vote of twenty-nine to ten.

The PRESIDENT: Gentlemen, I thank you for your past courtesies and for your consideration in sustaining me in the position which I held during the past year. Now I am very glad to get back on the benches to help you criticise, and leave our management in the hands of these four gentlemen: Dr. Williams, our President; Dr. Clement, our Vice-President; Dr. Robertson, our Treasurer, and our worthy Secretary, Dr. Hoskins.

Dr. WILLIAMS: Gentlemen, it would be practically useless for me to attempt to convey my feelings to you in regard to the honor which you have seen fit to confer upon me individually. I looked upon the matter, however, from a different standpoint than that of individualism, and that it is a move with a motive to make this Association still more secure in its national character than what it has been heretofore, this being the first time you have seen fit, in your history of nearly thirty years, to confer this honor on a veterinarian west of the Allegheny Mountains. Our membership is growing rapidly in that section, and I hope we can greatly solidify and strengthen our influence in that part of the country.

I recognize, however, that you have placed upon me a very great and

serious responsibility at this particular time, and, personally, I could well wish that you had chosen an older and more experienced man than I for the position. Nevertheless, I am always willing to do whatever I can, and I have met with such cordial assurances from all the Eastern members of their earnest support, that I feel we can make a successful meeting at Chicago next year, and I am sure this support would be highly necessary in this instance, as we cannot succeed except by your united support, which I hope you will freely grant.

I will not attempt to make any speech to you in regard to the election, more than to briefly express to you my appreciation of the honor conferred upon me. I wish to state that at this critical period, more than any other, I think it highly desirable to continue the Association in practically the same lines and in very much the same hands in which it has been so successful during the past few years. In so far as my power extends, I shall call to my assistance mainly those among you whom you have known as earnest and capable workers for the long series of years in your Association, all working in union wherever we can in Association work.

The SECRETARY: As there does not seem to be anybody else to do it, I would like to move you that we extend the retiring officers our heartiest vote of thanks, and in doing so I recognize, as we all do, the progress that this Association has made under our retiring President. He has been one who has devoted himself assiduously to the welfare of the Association, and at no hour or time of day was he too busy to listen or to consider any proposition that was for your welfare, and I think we owe to him and to his colleagues a very hearty vote of thanks.

Dr. SALMON: I rise, Mr. President, to second that motion; but I must suggest a very slight amendment that is necessary because of the Secretary's extreme modesty. I wish to include all of the officers of the Association for the past year. There should be no distinction. I second this resolution, with the amendment that the resolution include thanks to all the officers of last year.

This motion was put and carried amid applause.

Dr. LIAUTARD: Gentlemen, I do not know whether you all feel as I do, but I feel that the more I come to the meetings of this Association the more I am benefited by it. The more I come and listen to the papers and discussions the more I become convinced of my desire to live to be a hundred years old in order to improve my knowledge and know a little more than I know now. Here, for instance, to-day, I have learned a great many valuable facts, and I am going home carrying with me an enormous load of thought and benefit derived from what I have heard. For illustration, I have listened, as you have all done, certainly with a great deal of attention, to the paper of Dr. Salmon. I

have been wrapped up in the work done by our young friend, Winchester. I have taken a great deal of interest in the paper contributed by our friend, Dr. Williams, on the work of the Agricultural Colleges and Experiment Stations. I have been very highly interested, and I certainly regret we are cut short for time, because I could acquire much more information if I could listen to a discussion of the paper by Dr. Gadsden. It seems to me it would be an improper thing for us to part without extending to all those gentlemen who have spoken to us and given us such enjoyment, a very hearty vote of thanks for their labor. Certainly all of them have worked hard and have given us a great deal of interesting and instructive matter, for which we must thank them. I move that a vote of thanks be extended to all those gentlemen for the papers read here to-day.

Dr. NESBITT: I move to amend the motion and thank the Massachusetts Veterinary Association for the good time they have given us.

The motion was accordingly amended, and then passed unanimously.

Dr. HOWARD: Perhaps it would be proper for me to state right here, in regard to the amount of time consumed, that we of the Massachusetts Association appreciate very highly the honor which the Association has conferred upon us by holding its meetings in this city, and to assure the gentlemen that we have enjoyed their meeting very much, and hope it will not be long before they are with us again, and if there is anything to be found in the bottom of the sea, next time we will find it.

Dr. GADSDEN: Mr. President, we should like to hear one word from the Vice-President.

Dr. CLEMENT: I do not know that it is necessary for me to say more at this time than that I am very thankful for the honor conferred upon me in electing me to the office of Vice-President. I am proud to be able to assist Dr. Williams, especially proud, as I had the honor of nominating him last year for the office of President at Washington. I assure you that we shall take great pleasure in working for the Association in order that we may bring about as good a meeting as possible in Chicago next year. I again thank you, gentlemen, for the honor you have conferred upon me.

Dr. BUNKER: You have on your platform a face to which many of us used to look forward with a great deal of interest. We used to look for the little old gray on the corner of Fifty-fourth Street and see him coming down about four o'clock in the afternoon. We should like to hear from Dr. Robertson.

Dr. ROBERTSON: I would like to say in regard to that horse, that the old gray still lives. He is a Yankee horse and does not die. He is from Vermont. If you will come over some time I will drive you behind him. I have filled this office for several years, with the help of the Secretary,

and the only thing I am sorry for is the fear that he is going to spend all the money on the Chicago meeting, and I do not know how I am to get my expenses out there next fall; but I believe it is usual to call on the members to back us up, and I hope you will do so.

As there was no discussion on any of the other papers, the Convention at 5.30 P.M. adjourned *sine die*.

PAPERS
READ AT THE
TWENTY-NINTH ANNUAL MEETING
OF THE
UNITED STATES VETERINARY MEDICAL ASSOCIATION,
HELD AT BOSTON, MASS.,
SEPTEMBER 20, 21, AND 22, 1892.

THE SCIENTIFIC INVESTIGATIONS OF THE BUREAU OF ANIMAL INDUSTRY.

By D. E. SALMON, V.S.

CONSIDERED as an abstract proposition, there is probably no member of the veterinary profession who is not willing to admit the desirability of original scientific research. To the liberal-minded members of the profession the value of such research for the development of science, for the perfection of our practice, and for raising our profession to a higher plane in the eyes of the world, must be apparent. It has been generally agreed that the reproach of both the medical and the veterinary profession of this country has been the lack of activity and the poverty of results in the field of scientific investigation.

Every veterinarian who takes pride in his profession, and is at the same time a patriotic citizen of the United States, must have a feeling of regret that such a condition of affairs could exist, and he must equally feel an interest in all efforts that are made to correct it. While we should feel no jealousy of the scientific workers of the old world, and should welcome every contribution which they make to the fund of existing knowledge, we should certainly rejoice at every effort made in a scientific spirit in this country to conduct researches of the same quality and the same value as are made by the most advanced students in other lands.

This, it appears to me, is a legitimate deduction which may be drawn without fear from our common knowledge of patriotism and professional pride in all times and all countries. More than this, if I mistake not, it is one of the objects for which this Association exists, to promote and encourage scientific research. If I am correct in this, it follows that both the young experimenter who has taken his first steps in original research, and the more experienced one whose ambition leads him to attack the most difficult problems, should equally meet with welcome and favor when they bring their trophies

for the adornment of the organization of which they are members and which represents the veterinary profession of the country.

In saying this, it is not my purpose to take the ground that a paper read before this Association, or the results of the investigations of members published elsewhere, should not be discussed and criticised. On the contrary, it may be freely admitted that it is one of the most important of our privileges to discuss such papers, and in so doing to bring out points which may have been obscure or to call attention to conclusions which may be untenable. But the investigator has a right to expect in such discussions that this Association is gratified at every effort, however humble it may be, to pierce the mysteries of nature, and that when he brings his results before it, or when these are introduced by others, he will be received with courtesy, and that any criticisms will be fair and truthful.

It is vital to the success of this Association that such expectations should not meet with disappointment. Our great need is that we should have more original investigations, that the many peculiar problems which confront us in this country should be solved, and that they should be solved, if possible, by our own members.

These remarks are made by way of introduction to my paper, because this is the first occasion since I have been a member of this organization that it has been necessary for me to defend my work and my character from unjust assaults, made, not in the heat of debate by an individual, but with deliberation by one of our most important committees, and at a meeting from which I was unavoidably absent. The chief points of that report which relate to me I have already discussed in an open letter, which you have all had an opportunity to read (*Journ. of Comp. Med. and Vet. Arch. and Amer. Vet. Review*, both for January, 1892). In that, however, I was unable, for want of space, to treat with any detail the scientific questions involved, and, consequently, I shall take some of these up at this time.

To remind you of the tone of the report made at the last meeting of this Association I will quote only two sentences, which are taken from near the end. They read as follows:

"Having taken the investigation of swine diseases as a fair sample of this Bureau's scientific labors, are we to be expected to place any dependence upon the accuracy of the statements emanating from its officers concerning such work, especially when they conflict with the results obtained by men like Paquin and Billings, unless the work of the former is confirmed by experiments conducted by independent and unprejudiced observers of recognized ability?"

"How can we as a profession feel anything but disgraced when we think of the opinions which must be held in Koch's laboratory—the greatest bacteriological laboratory in the world—concerning our Bureau of Animal Industry and its scientific work?"

Is there anyone here who can find in those two questions any favorable appreciation of the scientific investigations of the Bureau of Animal Industry? or any encouragement for the scientists of that Bureau, several of whom are members of this Association, to continue their labors in this their chosen field? Quite the contrary. The entire field of scientific investigation in this country can be explored without finding an example of such rank injustice or of such uncalled-for defamation. It is for this reason that I propose to take up the matter at this time and show how accurate have been the reports of the Bureau and how untenable the positions of those who assailed them.

Billings has published an abstract of the paper of Frosch, referred to so much in Peters' report, under the title of "Billings's Investigations Vindicated," and Peters endeavors to give the impression that Frosch's report indorses the various positions which Billings has assumed, and shows that the Bureau reports have been incorrect and unreliable. It is true that he does not undertake to prove this by a citation of the facts, a course which would no doubt have been inconveniently troublesome, but his whole argument gives this impression, as is sufficiently shown by the short quotation which I have made.

Now, what are the facts about this subject? In the first report of the Bureau, that containing the work of 1884, the cause of swine plague was spoken of and figured in liquid cultures as a dumb-bell micrococcus. In recent years I have laid no stress on that early work, because it was done soon after I went to Washington, when bacteriology in this country was in its infancy, and when the Bureau had neither the instruments, the laboratory facilities, nor the assistance which we now know to be essential for such investigations. It is also well known that I had many other duties at that time, such as the organization of the Bureau and the investigation and control of an outbreak of pleuro-pneumonia in the Western States, which caused several long absences from Washington, one of which was of more than three months' duration. This is no reason why my scientific conclusions at that period should be received on any less evidence than is required from other people, but it is an explanation as to why the germ then figured was not studied under different conditions of

culture and in its effects upon different animals, so that its identification by other investigators would be easy and certain.

It is evident, of course, in the light of to-day that we cannot claim to have established the fact that the micrococcus of 1884 was a specific, pathogenic germ, because we did not give the means for the subsequent identification of this germ, either by other investigators or ourselves. It is significant, however, that a disease of swine has since been studied in Germany and in the United States, the bacteria of which grow in liquid cultures as did the germ figured in the report of 1884. There is only one discrepancy, and that was explained long ago and before anyone else had discovered it. It was stated in that report that the micrococcus liquefied gelatin. This error was owing to my culture, being then made in liquid media after the Pasteur method, as, on account of lack of assistance and laboratory facilities, the gelatin method was impracticable. Because of changes in the laboratory and my long absence, my cultures became shifted about, and in some cases the labels were misplaced. On my return it became necessary to hurriedly prepare my report, and a culture supposed to be the same as that previously photographed was plated to determine its effect on gelatin. The gelatin on this plate was liquefied, and on the strength of this one experiment the statement above referred to was made in the report. The error was afterward discovered and corrected by me, but it is still referred to by unscrupulous writers as a reason why the micrococcus of 1884 could not be identical with the micrococcus in 1886 and in subsequent reports.

A discussion of this question is of little importance at the present day, particularly when the one who made the investigations in question has since had the whole field worked over with all the appliances of modern science, and has unreservedly published the results. These old reports, which were made before exact bacteriological methods were introduced into this country, are only referred to now by those who wish to discredit the work of the Bureau; but they forget that if it is impossible at this time to prove the conclusion that the micrococcus of 1884 was identical with that of 1886, it is equally impossible for them to prove that the two were not identical.

What is well known to all of these writers is that under my direction the laboratory facilities of the Bureau were rapidly increased, that the work of experimentation was divided, that proper instruments were obtained, and that the results from that time to the present have been equal in accuracy, detail, and importance with those obtained in any other laboratory in the world during the same period.

In the report for 1885 the microbe of hog cholera was accurately described, and you may ransack the literature of the world for any description made previous to that time by which you can identify that germ.

In the report for 1886 the germ of the American swine plague was described, and the differences between this and the hog-cholera germ were plainly indicated. In the report for 1885 the disease investigated was referred to as swine plague, but before the following report appeared we received the report of Schütz on Schweineseuche, and also found that we had a disease of the same nature in the United States. With the two diseases before us, we decided to call the one swine plague which appeared to be identical with the Schweineseuche of Germany. Since Schweineseuche can only be translated as *swine plague*, this course appeared necessary to avoid confusion; and if this example had been followed by others who wrote afterward, the confusion which is now found in the nomenclature would not exist.

The impression which Billings and Peters attempt to give is that the investigations of Frosch sustain the claims of Billings and refute the conclusions of the Bureau of Animal Industry. This impression is absolutely false, as can easily be proved. It is true that Frosch was led, by reading Billings's misleading and, in many respects, incorrect reports, to express opinions uncomplimentary to the Bureau and discreditable to himself on subjects which he knew no more of than any other reader of the reports; but so far as his scientific investigations go—and that is all the evidence offered by him which is worth anything—he sustains the reports of the Bureau in every important respect.

After what has been read in your presence and published in our journals, I suppose the most of you are surprised that I can make such a statement. If I make it I am prepared to prove it, and I feel sure that no man can contest the evidence which I offer.

What was the first position taken by Billings in regard to the germ which was described by the Bureau in 1885? We will take his report published in 1888 as authority, as he then had given two years to the investigation, and he certainly cannot, therefore, accuse us of using his prematurely expressed opinions in making this argument. After two years of study and investigation, with the advantage of having our reports for 1885 and 1886 in his possession, he deliberately states that no such germ as our hog-cholera germ was found by him, that such a germ has no existence, and that our germ was a fabrication, or, to use his own words, "a forgery."

Referring to the Bureau experiments of 1885 he says: "Furthermore, their value is absolutely nullified, for the simple reason that no such germ exists in connection with swine plague as that described above." (University of Nebraska: *Second Report from the Pathobiological Laboratory*, 1888, p. 54.)

Again he says: "By thus ignoring them, he silently admits that they were not 'un-' but 'well-founded statements;' and hence, as he has not and cannot prove them to have been or to be erroneous, and those which he alludes to of 1885 are of the same nature, I emphatically declare that all Salmon's assertions with regard to the specific microscopical appearances of any true and specific pathogenic micro-organism in connection with hog cholera to be one continued series of 'unfounded statements' down to the issue of his report of 1886." (*Loc. cit.*, p. 68.)

Once more he says: "I positively assert that Salmon's assertion of a distinct germ for the disease which he now calls hog cholera is erroneous, and that the description of that object is a forgery; that it does not exist or occur in any form of the American swine plague, and that neither Salmon nor anyone else can demonstrate the presence of that object in the tissues or blood of any hog that has died of swine plague in any part of this country if the examination is made before cadaveric changes have taken place.

"That the object described by Salmon as the germ of the hog cholera cannot be cultivated from the tissues of any animal that has died of hog cholera or swine plague." (*Loc. cit.*, p. 74.)

He returns to this subject as follows: "That this substance does not represent a spore condition or have any relation to spores is, to my mind, entirely beyond all question, as I have searched most diligently for spores in old and fresh cultures, and others made at all kinds of temperatures within the biological limits of these organisms, my search being inspired by the description of what I pronounce a forgery, of a germ (which represents a spore), as the cause of swine plague, by Mr. Salmon, in 1885, and again in 1886, as the cause of an assumed porcine pest, to which Mr. Salmon now gives the name of 'hog cholera.' This Salmon object does not exist, never has existed, and never will have any etiological connection with the American swine plague, as has been conclusively demonstrated in this report." (*Loc. cit.*, p. 111.)

In his post-mortem notes he says: "Though the lesions here described must and will completely fill Mr. Salmon's picture of his 'hog cholera,' described in his report of 1886, but in this, as in every

other case, Mr. Salmon's specific 'hog-cholera microbe' was missed, and 'it ever will be missed' in the American swine plague, no matter who seeks it, or how much time they spend in the hunt." (*Loc. cit.*, p. 136.)

In another post-mortem note he says parenthetically: "It does not seem as if any one could have seen more extensive lesions in the large intestine, which Mr. Salmon says are characteristic of his 'hog cholera,' yet his manufactured germ of 'hog cholera' never had any connection with the lesions in this hog." (*Loc. cit.*, p. 163.)

At the conclusion of his post-mortem notes he adds: "After several hours spent at this useless job, we were unable to find any other micro-organism than that invariably found in every case of swine plague we have investigated, and which has been described as a 'belted ovoid organism which colors at its pole ends,' and which bears no resemblance to the Washingtonian-Bureaucratic non-descript." (*Loc. cit.*, p. 164.)

I have already made enough quotations to demonstrate Billings's position on this question in 1888, when his report was written; but it is my object to show that this was the main idea of that report, the conclusion upon which the whole structure was built. As so much depends upon this one fact, I trust you will bear with me while I demonstrate that from the beginning to the end of the four hundred pages these assertions are repeated as the corner-stone of the whole argument.

Describing an autopsy made by himself and Dr. Roberts, of Creighton, Neb., he adds:

"The above case is of special interest, and is only introduced here because if there ever was a case of swine plague which absolutely corresponded in every particular to Mr. Salmon's 'hog cholera,' this one did. Hence, the most exact search was made in seeking micro-organisms, but in the blood, in the spleen, in the liver, in the lymph-glands, neither Dr. Roberts nor myself could find any other organism than that described by me in this report as the only germ of swine plague. Cultures were made and the same organism developed. Dr. Roberts being here with me, and interested in this work, as well as being a regent of the university, he was doubly interested in endeavoring to find anything like the organism described by Mr. Salmon as occurring, according to him, in just such cases. Here was no room to say with Salmon, the lungs being affected, the germ of swine plague and that of hog cholera may both be present. After spending more than an hour in examining and re-examining the

fresh organs, all of which were kept carefully covered, except for the moment necessary to clip out a small piece of tissue, we gave up the search, finding nothing but the one organism, and nothing resembling in any way the one described by Mr. Salmon in 1885 as the cause of swine plague, which had no polar staining whatever, and in 1886 as the cause of his 'hog cholera.'

"Such testimony as this should be conclusive. A mistake is absolutely impossible under the circumstances. This result simply corresponds with over 500 such experiences." (*Loc. cit.*, p. 259.)

Finally, referring to my experiments in producing immunity in pigeons with the chemical products developed during the growth of the hog cholera bacterium, he writes :

"Hueppe seems to be absolutely unaware of the fact that the experiments he refers to were published in Mr. Salmon's report of 1885, when he said that the peculiar organism, which he then called the 'new microbe of swine plague,' was entirely different from that of Schütz. Hueppe is also unaware of the fact that that same organism suddenly became the cause of Mr. Salmon's 'hog cholera' in 1886, as he is that that organism has no existence in the American swine plague." (*Loc. cit.*, p. 394.)

Two pages further on he says :

"With this apparently positive evidence in his hands, why did not Mr. Salmon proceed with such valuable work in 1886 and 1887, not to speak of the present year?

"Why does he not mention any further experiments of the same kind in his report of 1886 or his later publications?

"What is he employed for but to do this thing?

"The true answer is easy to discover.

"*Because Mr. Salmon is fully aware that no such organism as his swine plague 'new microbe' of 1885, or his 'hog cholera' of 1886, 1887, and 1888, exists as an etiological moment in swine plague.*" (*Loc. cit.*, p. 396.)

These extracts are certainly sufficient to demonstrate Billings's conclusion as to the germ of hog cholera up to the time his report was written in 1888.

Was he right or wrong in his conclusion that no such germ as the hog cholera microbe existed, and that it had never been found and never would be found in the American swine disease? Is there any one in this Association, or, indeed, any one in the country who believes that Billings was right and the Bureau wrong on this fundamental question? You all know better. You know that all who

have since investigated the question have acknowledged the reality of the hog cholera microbe and its etiological relation to that disease. Even Billings himself has since adopted it, and in the September, 1892, number of the *Journal of Comparative Medicine* he gives a figure of it, which does not correspond in the least with the figures in his report or with his description of it as an "ovoid, belted germ" morphologically identical with the microbe of Schweineseuche.

All the statements of his which I have quoted were, therefore, radically wrong so far as they denied the existence and the etiological relation of the hog cholera germ. Were they wrong as to the germ which he found at that time? This question we will consider later; but it should be remarked here that Billings claims to be a bacteriologist, and that consequently he should be able to discriminate between two such radically different germs, especially after the points of difference have been so carefully pointed out as they were in the report of the Bureau for 1886.

Under such circumstances the investigator's own conclusion must be taken, when it is given in such positive language, and no one has a right to go behind it and claim that the investigator meant something different from what he wrote. The investigator has the germs under his own eyes, and if he cannot tell what germ he has, how ridiculous it would be for some one else, who has never seen the germ, to attempt to decide from the written description of the man who himself cannot tell.

In the face of these facts, how could the Committee on Intelligence and Education pretend, in their report at the Washington meeting, that the discovery of the identity of the Billings swine-plague germ (as now accepted by him) with the hog-cholera germ of the Bureau, sustained the claims of Billings and showed the Bureau reports to be unreliable? How could the committee record its belief that his work was "really correct and valuable" and that ours was a disgrace to the profession? How absurd this is when it is apparent that the man, who in his report reiterated again and again his conclusion that no such germ existed, is only too glad to give the impression now that this was the germ he was working with from the first.

How could the committee with such undisguised exultation tell us that: "Dr. Billings boldly announces that he found his germ of swine plague in July, 1886, among the first pigs that he examined in Nebraska, which had died of the disease." Did the committee stop to inquire what germ he found at that time? Did they take into account his many denials of the existence of any germ which

has the least resemblance to the hog-cholera germ of the Bureau reports? If so, how can they come before this meeting and try to give the impression that the germ which Billings first found in Nebraska was identical with the hog-cholera germ of the Bureau? These are serious questions, and relating as they do to an attack upon the reputation of individual members of this Association, as well as upon that of a Bureau in which veterinarians are especially interested, we have a right to demand that they be answered.

We may also ask, with much reason, how Frosch can consider that Billings's inoculations of hogs with a germ which the experimenter insists was not the hog-cholera germ, and has no resemblance to it, nevertheless fills out the gaps and bridges over the doubts which he believes to exist on account of what he calls our objectionable methods in proving the pathogenic action of the hog-cholera germ? He certainly has no right to assume that because Billings sent him the hog-cholera germ as his swine-plague germ, in 1889, that this was the germ with which he worked previous to 1888, when Billings expressly says so often in his report that it was not that germ. This is one of Frosch's conclusions drawn from data other than that obtained from his bacteriological investigations, and it shows how utterly unreliable he is when he leaves his own results and attempts to analyze and weigh reports of investigations written in the English language. For no one can suppose that inoculations with one germ would be of any value toward proving the pathogenic action of an entirely different organism.

This is only one of the attempts which he has made to criticise the Bureau and indorse the work of Billings in cases where an examination of the latter's report does not sustain his language. For instance, he criticises the Bureau reports because the cultures used for inoculation were not derived from single colonies on gelatin plates, and yet he unhesitatingly accepts the inoculation of Billings as bridging over this gap, although we search in vain through Billings' report for any evidence that his inoculation material was obtained from plate cultures. It should also be remembered that it is very evident from the communication of Schütz on the Schweineseuche of Germany, which appeared about the same time as our report of 1885, that plate cultures were not used for obtaining the virus with which his inoculations were made. And yet his conclusions have not been contested either by Frosch or others. When his attention was called to this by Smith, Frosch contented himself by characterizing the allusion to Schütz as "wholly unjustifiable," without troubling himself to go

into particulars. As the cases were in every respect parallel, the unbiased reader must continue to wonder what subtle distinction was conjured up by the fertile imagination of the German investigator.

"Again," Frosch says, in reply to Smith, "after the determination of the identity with Salmon's hog-cholera bacterium I was compelled, in testing the chief question of the pathogenic nature of this bacterium for pigs, for which experiments of my own were not possible, to base myself upon the statements of Billings. For this Mr. Smith must blame himself, since I regret to have to repeat it, the methods and experiments laid down in the reports of the Bureau of Animal Industry for the years 1885 to 1888 did not in a desirable manner come up to the standards demanded in the determination of a new infectious disease. I need not make myself guilty of a repetition of that which has been said in my article, since Mr. Smith agrees with me in this regard with reference to the report of 1885. On the other hand, even a superficial examination of the other mentioned reports shows that Koch's methods were not applied exclusively or exactly, although this was unconditionally demanded by the creation of a second infectious agent of swine plague which appears at the same time and is so clearly related to it."

The query which naturally suggests itself here is: If an exact and exclusive application of Koch's method was required to make the Bureau investigations acceptable to Frosch, why was not a similar application of Koch's method necessary to make Billings's investigations acceptable to him? He makes two objections to our inoculation experiments: first, that the virus was not obtained from plate cultures; and second, that the control animals in some cases died as soon or even sooner than the inoculated ones. This last objection should carry but little weight because, as pointed out by Smith, an inspection of the records shows in every case where the controls died, at the same time or earlier than the experimental animals, that this was accounted for by the disease being of a more acute type.

When we analyze the report of Billings we find that what Frosch calls extensive and valuable experiments consist of 33 pigs all told which were inoculated, and 2 which were fed. Of the 33 inoculated at different times it is stated that 2 died, and that 3 were killed for examination, and that "the same general results occurred" with 6 others as with 1 of those that were killed. The 2 that were fed died. There is not a particle of evidence that the virus used in any of these cases was obtained from plate cultures, and control animals did not

complicate results, for the very good reason that there were none in any of the experiments.

It surely is not necessary for me to dwell at greater length upon Frosch's bias in Billings's favor and the unaccountable conclusion to which this led him. But these are minor points which should not lead us to undervalue his contribution to this subject when considered as a whole. The serious thing to us is, that it was these details in his statements—details based upon the flimsiest foundations—which attracted the attention of the Committee on Intelligence and Education, blinding the members to the real facts of value which were brought out by Frosch, and leading them to denounce in unmeasured terms the investigations of the Bureau of Animal Industry and all individuals connected with them.

It may be remarked here that no one can steal a discovery from another by objecting to the methods by which that discovery was made. Koch's early investigations of the anthrax bacillus were made by methods very objectionable from the standpoint of to-day, but his demonstration of the etiological relation of the bacillus to the disease cannot be taken from him on that account. And so, when a germ is isolated and described as carefully as was the hog-cholera bacillus by the Bureau of Animal Industry, when its effects on various animals and its biologic characters are made known, the investigators ought not and cannot be cheated out of due credit when their conclusions are confirmed by competent scientists. The value of investigations is shown by their fruits; and if the conclusions are proved to be correct the methods may in the end turn out to be as satisfactory as those used by that other class of investigators whose chief object in life is to assail and embarrass the workers who are building up science and advancing the interests of their profession.

We will now turn to Frosch's report, and see what there is of importance which sustains or conflicts with the reports of the Bureau. His most important conclusion is, that "The bacterium of Salmon's hog cholera and that of Billings' swine plague are identical, and that the same is to be looked upon as the cause of the American swine plague." That is to say, the bacterium sent to Koch by Billings in 1889 was identical with the hog-cholera bacterium described in the Bureau reports for 1885 and 1886.

There was nothing unexpected in this conclusion, for we already knew from the report of the Commission of Inquiry appointed by the Department of Agriculture, and from the investigations of Prof. Welch, of Johns Hopkins University, that Billings at this period

had adopted our hog-cholera germ as the cause of his swine plague. The surprise came when Billings placed our hog-cholera germ into the hands of the Commission as the cause of his swine plague after he had so long denied the existence of that germ.

If we assume for the present, notwithstanding the denials in his report, that this writer had been working with the hog-cholera germ during the first two years of his investigations, that is from July, 1886, to July, 1888, then it becomes a point of great interest to learn whether Frosch was able to identify the germ from our description. If he could not, then, there might be some excuse for Billings's frequent denials of its existence. It should be remembered that the Commission of Inquiry and Prof. Welch had both expressed their conclusion that our description was correct and sufficient for the identification of the germ. Now what does Frosch say?

He says: "We will hence briefly review Salmon's statements bearing in this direction, in order to prove how far the same correspond, free from objection, with the criteria set up by Koch for an infection cause.

"If the reports of Salmon concerning the hog-cholera bacterium are next viewed from this standpoint, then a sufficient characterization, morphologic as well as biologic, of the same is given, which allows no doubt to arise concerning its identity."

Again he writes: "A culture of this hog-cholera germ was the object of a short confirmatory examination in the Hygienic Institute of Berlin, in the year 1888, by V. Esmarch, and in this it could be determined that the same answered in the main with Salmon's statements, as also that this bacterium corresponded with no cause of infection in pigs known (in Europe, D. E. S.) at that time."

How does it happen that unequivocal statements like this on points of prime importance should have been passed over in silence by the Committee on Intelligence and Education, while every effort was made to give the impression that the Bureau reports had been shown to be unreliable?

At the meeting of this Association in Baltimore in 1888 I read an extract from a letter received by me from Koch, in which was given the results of Von Esmarch's examination of the culture of hog cholera germs which I had sent to Koch for his opinion. Billings quotes from that letter in his report, and his remarks on it show how completely wrong he was on the whole subject at that time. This is what he says:

"What does Koch's evidence show?"

"Nothing but that some unknown germ was sent him that had some kind of effect on 'mice and guinea-pigs,' but not that it had any on hogs. It does show that it does not occur in any swine disease known to him as occurring in Europe, and all the evidence quoted by me goes to show that the so-called swine plagues there are one and the same with that in this country, except the Wildseuche and Rouget." (*Loc. cit.*, p. 246.)

Again, he writes in the same connection :

"Has Mr. Salmon given a particle of evidence showing that this germ produces a single lesion, or does a single thing that that of swine plague does not ?

"Then, reader, what is it ?

"I will answer for you : An imposition !

"Not content with giving such condemnatory evidence against himself, Mr. Salmon has gone so far as to pile it up so high that his eventual crushing into a worse specimen of nonentity than his 'hog-cholera' psychosis is but a question of time. He has done this by sending a lot of cultures of his 'nonentity' to European investigators, all of whom say that they have never met with it, and that it does not occur in any case of swine plague known to them in their respective countries. They certainly 'settle the question' that there is no such pathogenic germ known to them, and I think the question has also been sufficiently settled that the real swine plague, with its one ovoid, belted germ, is either known to them all, or that there is evidence that it exists in their respective countries, except the, at present, somewhat peculiar character of the testimony from Sweden and Denmark with regard to the micro-organism, of which I have no fears that the little inconsistencies will eventually be cleared up."

The time has come when all of these little inconsistencies have been cleared up, but not in the way that Billings anticipated. After reading that Von Esmarch found the germ to answer our description, and that Frosch finds that description so complete that no doubt can arise concerning its identity, and that this germ is the cause of the American swine disease, what can be our opinion of Billings' contention ? And, above all, what are we to think of our Committee on Intelligence and Education, who demand that when the statements of the Bureau conflict with the results of men like Billings they must be confirmed by independent investigators before any dependence is placed upon them ?

I have not space to go into details concerning the many points of resemblance found in the description of the hog-cholera germ, given

by Frosch, and in the description contained in the Bureau reports for 1885 and 1886. I will, however, enumerate the principal ones. The form and dimensions are given as exactly the same 1.2 to 1.5μ in length by 0.6μ in breadth, both stating that they are liable to variation under different conditions. Both state that they are found in the blood and tissues oftener in pairs than single; that while they stain readily by the usual solutions of aniline substances, the staining by Gram's method is unsuccessful; that they are actively motile in fresh cultures; that they grow upon the acid surface of the potato; that they do not liquefy gelatin, and that the gelatin colonies are brownish disks, often having a dark centre which makes them resemble a nucleated cell; that they grow upon the usual culture media in both room and incubator temperatures, presenting in each case the same appearances; that the time between inoculation and death is longer than with other septicæmic diseases; that mice, rabbits, and guinea-pigs are very susceptible, while pigeons require a dose of about 1 c.c. to produce fatal results, and chickens are insusceptible; that in pigeons the pectoral muscle on the side of the inoculation assumes a parboiled or cooked appearance, while in inoculated mice and rabbits the liver becomes enlarged and presents numerous foci of coagulation necrosis.

In addition to the above, each author has mentioned some point which he considered of value; but, taking simply the points which harmonize, we have a picture which clearly differentiates this germ from any other known micro-organism, and which is amply sufficient for its identification. Frosch himself says, after giving the results of his examination of the culture sent by Billings: "If one now compares these results with the description of the Salmon hog-cholera bacterium, then such a similarity of the two bacteria in the main points of morphology and biology is found that their identity cannot be doubted, and it would be superfluous to again enter more closely upon the individual points in which they correspond."

If Frosch is correct in this opinion, and no one who has examined the question can have a reasonable doubt, and if Billings had in 1888 the same germ which he sent to Koch in 1889, what can be his justification for denying the existence of the hog-cholera germs described in the Bureau reports? Upon this supposition, do not his own reports make him out a bungler as an investigator and an ignoramus in bacteriology?

Billings is now willing to have it assumed that he was working with the hog-cholera germs from 1886 to 1888, and by so doing puts

himself in a position where such unenviable charges naturally suggest themselves in connection with his work, because he finds even this embarrassment preferable to the other horn of the dilemma. I do not see how it can be admitted that the germ which he then described was the hog-cholera germ.

If his plates on page 104 of his report and Fig. 3, Plate 3, at the end of that work are examined, it will be evident that they do not represent the hog-cholera germ but rather that of the German swine plague. He insists in the text that this is the case, for he says: "We have thus described the normal, or general, cycle of development of the micro-etiological organism of the swine plague, the 'Wildseuche,' and hen cholera, as well as rabbit septicæmia, Texas fever, and yellow fever, all of which diseases are caused by a member of this class of 'belted' germs, and should be classed as extra-organismal, local, or land septicæmia." (*Loc. cit.*, p. 113.)

Again he says: "This concludes my observations of the micro-morpho-biological phases presented by these micro-etiological organisms in the course of their development." (*Loc. cit.*, p. 114.)

Without stopping to discuss the nature of the micro-organisms of Texas fever and yellow fever, it may now be asserted, even on the authority of Frosch, that if Billings was describing the micro-morpho-biological phases of the germs of Wildseuche, hen cholera, and rabbit septicæmia, he was not describing those of the hog-cholera germs, because the latter is an entirely different micro-organism.

It surely is not necessary for me to quote extensively to prove that throughout Billings's report he repeats the statement again and again that the germ of his swine plague was morphologically identical with the germ of Schweineseuche. The idea runs parallel with and is equally prominent with his other conclusion, that no such germ as the hog-cholera bacterium could be found in the American swine plague. In one place he says: "I emphatically declare that all Salmon's assertions in regard to the specific microscopical appearances of any true and specific micro-organism in connection with hog cholera to be one continued series of 'unfounded statements' down to the issue of his report of 1886." (*Loc. cit.*, p. 68.)

And again: "It matters nothing to the hog-raisers of the United States whether this germ was discovered by me on July 7, 1886, or by Salmon on July 1, or even in 1884." (*Loc. cit.*, p. 69.)

Another remark is even plainer, as follows: "Can anyone comprehend what could have induced Mr. Salmon to say (of the true swine-plague germ, but which he falsely asserts to be the cause of a

'chronic pneumonia,' *Report*, 1886) it is probably identical with the micrococcus described in my report of 1884, etc." (*Loc. cit.*, p. 392.)

We see by the quotations which have been made not only that he considers the germ which he then had as identical with the Schweineseuche germ, but that he accepted the descriptions of the Bureau swine-plague germ as applying to the germ described in his report. While he held that there was but one swine plague in the United States he insisted that this was caused by an organism morphologically identical with the micro-organisms of Schweineseuche, hen cholera, rabbit septicæmia, and the Bureau swine plague. (See also *loc. cit.*, pp. 293 and 332). And he denied the existence of a disease produced by the hog-cholera germ.

Now, what was the effect of Frosch's report upon this position? Billings and the Committee on Intelligence and Education claim it as an indorsement, and if we accept it as such the query suggests itself, How many such indorsements can a writer have and survive? Billings and Frosch both claim that there is but one swine disease in this country which should be called a plague—the former says it is caused by the Schweineseuche germ, the latter says it is caused by the hog-cholera germ. Billings says there is no disease produced by the hog-cholera germs in the United States; Frosch says there is none caused by the swine-plague germs. This certainly is one of the most remarkable indorsements on record.

With this condition of affairs before us, we must inquire whether it is not possible that Billings had the hog-cholera germs in his cultures previous to 1889, as well as after that date. Do not these germs resemble each other so closely that a bacteriologist might be excused for thinking he had one when really he had the other? So far from this being the case these two germs are radically different, and any bacteriologist who confessed his inability to distinguish between them after studying them for two years would certainly lose his reputation.

Frosch finds no difficulty in pointing out the most radical differences, although he evidently tries to let his friend Billings down as easily as possible. He shows that the hog-cholera bacterium is motile and bears flagella, while the swine-plague bacterium has no power of movement and no flagella; the former grows at the extremes of temperature of 8° C. and 42° C., the latter has no growth at either of these extremes; the growth of the latter upon gelatin and blood-serum is much finer, more delicate, and more clinging; the former in liquid cultures forms in twenty-four hours an equal turbidity and

later a sediment, while with the latter there is only a slow growth found upon the bottom of the tube, always in flakes adhering to each other; in gelatin the colonies along the needle-track with the swine-plague bacterium are much finer and the surface growth more delicate, and on plates the colonies do not reach half the size of the hog cholera; the swine plague only grew on potato when the latter was alkaline, and, as it is usual for boiled potatoes to have an acid reaction, the germ would not grow upon them, while the hog cholera grew abundantly when they were acid; the hog cholera growth on potatoes was always luxuriant and of a dirty light-yellow color, that of swine plague (on alkaline potatoes) formed flat, not very extensive, gray or yellowish gray fields. The hog cholera grows better without oxygen than the swine plague, and in general the former has a greater growth-energy. Agar tubes colored with lachmoid and sulphindigotate of soda were discolored by the hog-cholera germ, while those with litmus remained unchanged; with the swine plague the litmus and indigo tubes were unchanged, but the lachmoid was slightly discolored. The swine-plague germs produce phenol and indol during their growth; the hog cholera, neither of these bodies; while the size is variable the latter in general produces coarser forms.

Guinea-pigs have a certain power of resistance to the swine plague, are exceedingly susceptible to the hog cholera; the reverse is true concerning the susceptibility of pigeons. In all susceptible animals death occurs from two to three days sooner after inoculation with swine plague than with hog cholera. The local reaction is as insignificant and trifling for the hog-cholera germ as it is remarkable and severe for the swine plague. The hog cholera produces multiple coagulation necrosis in the acini of the liver, while when inoculated with swine plague this organ tends to undergo fatty metamorphosis. Both agree in that they are found in the blood, that they are most numerous in the spleen, and next to this in the glandular parenchymatous organs, as also in the muscles of the body. They differ in that the blood of the ventricles and auricles, as also that of the main bloodvessels, is comparatively poor in hog-cholera bacteria, while in acute cases of swine plague these localities are just as rich in bacteria as the above-named organs. In hog cholera some of the capillaries are found fully plugged with rod-like bacteria, while in the regions lying between no bacteria can be observed; the swine-plague bacteria, on the contrary, are evenly distributed in the capillaries and are never so thick as to cause plugging.

Finally, the swine-plague germ is found in great numbers, almost

in pure cultures, in the inflammatory œdema at the seat of inoculation, as also in the not infrequent exudates in the thoracic and abdominal cavities, while the hog-cholera germ is so sparingly present at the seat of inoculation as well as in the small, hardly more than normal, amount of fluid in these body cavities that it can often be detected only with the plate culture-method. To these differences enumerated by Frosch we may add that the hog-cholera germ is most frequently seen in pairs when cover-glass preparations from the organs of the affected animal are made, while the swine-plague germ affected under the same conditions is generally single.

I have summarized these points of difference from Frosch's paper in order to ask if it is possible for any bacteriologist to mistake one of these germs for the other after he has studied them in cultures and by inoculating animals with them? And yet, to assume such a mistake, is the only way in which we can harmonize the germs sent by Billings to Koch with the description in the former's report.

I am aware that some of the statements in his reports indicate that the hog-cholera germ was under investigation, while others would indicate that it was the swine plague. For instance, the statement that he watched the development of the germs in a hanging drop culture would be absurd if applied to the actively motile hog-cholera germ. Frosch tried to follow him in this, but gave it up as impossible. On the other hand, the luxuriant growths on potatoes, which he describes, could never come from the swine-plague germ. Again, the first cultures which he sent to Europe are said by Bunzl-Federn, to have developed acidity in milk cultures and to have formed phenol and indol, which shows them not to have been the hog-cholera germ, while later he undoubtedly sent the hog-cholera germ to different investigators. If we accept these various statements of facts we can only conclude that he at one time had one germ and at other times the other germ; indeed, this is indicated by his inoculation experiments, in which some of the animals died too soon for death to be caused by the hog-cholera germ, and others after too long a period to indicate the swine-plague germ.

It is no task of mine, however, to explain his inconsistencies and contradictions. I should not have taken the trouble to point them out had his work not been held up to this Association in connection with Frosch's report in the attempt to show the reports of the Bureau of Animal Industry to be unreliable. I have shown you how Billings's conclusions stand, or rather fail to stand, when tried

by Frosch's investigations. Now, let us see how the Bureau's conclusions fare when compared with these and other recent investigations.

In 1885 the Bureau described the germ of hog cholera, a germ so different from any previously described in swine diseases that for a long time our conclusions were not accepted as correct by any other investigators. In 1886, soon after Schütz's report appeared, we showed that the germ of hog cholera was essentially different from that of the German Schweineseuche, and that we had another disease with a germ which appeared to be identical with the germ of Schweineseuche. It is unnecessary at this time to go into particulars as to how these conclusions have been contested both at home and abroad, but fortunately they are now both vindicated by independent investigators.

As to the hog-cholera germ, its pathogenic character and its difference from the Schweineseuche germ, we need no further evidence than is given by Frosch. The latter, however, has seen fit to contest the specific and pathogenic character of our swine-plague germ, particularly as related to a plague of equal distribution with hog cholera. This opinion of his is not founded on any investigations of his own, but upon captious criticisms of our methods. It may be said in the first place that we never claimed that swine plague had an equal distribution with hog cholera. This was a question which could only be decided by more extensive investigations than we have been able to make. We did say that it was a widespread plague, and we see no reason to change our views.

As to whether Frosch was right in his assumption that the swine-plague germ discovered by us was not the cause of a specific disease, distinct from hog cholera, we must decide by the results obtained by other investigators. The Commission of Inquiry recognized the existence of such a disease; Welch, of Johns Hopkins University, has studied it; Jeffries had undoubted cases of it; and even Billings, after first accepting it as identical with his swine plague, and later denying its existence, comes around finally, and admits that he has seen a few cases.

One of the most satisfactory studies of the question is that made by Afanassieff, at the request of Baumgarten. It will be remembered that the latter, judging from Billings's reports, had stated his belief that there was but one swine plague to be considered as existing in this country, and that this was identical with the German Schweineseuche. The result of the studies of Afanassieff is a com-

plete confirmation of the reports of the Bureau. Not only does he confirm Frosch in showing that the Billings swine-plague germ as at present sent out is identical with our hog-cholera germ, and different from the Schweineseuche, but he finds that our swine-plague germ is practically identical with the Schweineseuche, as we concluded six years ago.

The whole subject of the characteristics and pathogenic effects of the hog-cholera and swine-plague germs may now be regarded as cleared up by the investigations of independent workers in Europe. For years Billings, supported by others who should have known better, succeeded in keeping up doubts as to the facts, and particularly as to the correctness of the Bureau reports. For our part we have patiently waited until independent workers should take up the subject and settle it by laboratory researches instead of by polemical writings. We have had a long time to wait, but our work is now confirmed on all sides, and our Nebraska antagonist is left between the two horns of a dilemma, either of which is fatal to his pretensions as a bacteriologist.

So much for the fundamental questions involved. But since our committee tells us that "work which is recognized as valuable abroad cannot be ignored at home," it will be interesting to briefly examine some of the collateral issues which have been raised. In his report from which I have already quoted, Billings writes :

"The interesting question now is, What kind of an organism is Mr. Salmon sending round as the 'specific microbe of hog cholera?'

"It shows a singular want of scientific exactness that Rietsch, of Marseilles, who had it while making his own investigations, does not give any description of this thing. It has been absolutely impossible for me to get any culture of this organism, but last summer Dr. Detmers sent me a slide marked as follows: 'Bacterium Salmonidi,' on one label, and on the other, 'Doctor B. Persh, culture in gelatin, October 24, 1886.' This organism bears no relation to anything described by Salmon, either as to the germ of swine plague in 1885, or of his hog cholera in 1886, except, perhaps, in outline morphology; it is a small ovoid organism, about three times as long as wide, and has rounded ends, but colors, or is colored entirely, and it does not seem as if the tincture had been too strongly applied. Sometimes, when in process of fission, there does seem to be a very slight clear space in the middle of the body, but in no way does it resemble Mr. Salmon's description or plates, with the exception of the very latest, where the ends do color somewhat.

"Is this Mr. Salmon's 'hog cholera' bacterium?"

"As to that I know not, but I will permit Dr. Detmers to tell his own story about it."

This is very peculiar writing for a bacteriologist. The organism, he says, bears no relation to anything described by me except, perhaps, in outline morphology. In what other respect would he expect a resemblance in a mounted preparation of germs? We certainly have had very little information from any writers as to the internal structure of bacteria. What he means, no doubt, is that the staining did not correspond with the description in the Bureau reports. It should be remembered, however, that the description was expressly stated to apply to the germs as stained in cover-glass preparations from the blood and organs of affected animals. Our photographs of stained germs from cultures, given in the report for 1886, shows the germs solidly stained.

It is certainly well known to every bacteriologist that germs of the same species grown in different media vary morphologically, and, therefore, if a description is to be verified the conditions must be the same. The typical preparations showing the end-staining of the swine-plague germs and the unstained middle belt are most reliably obtained from the blood and other tissues of affected animals. To make a comparison, the hog-cholera germs should be obtained from the same source.

The first thing that strikes one in staining such preparations is that the swine-plague germ still shows its peculiar staining perfectly when kept in the coloring liquid a length of time that would make the hog-cholera germ a uniform color throughout. Consequently, in staining the latter germ more discretion must be used to obtain its typical appearance. The typical appearance is much more difficult to obtain with the organisms which have been grown in various culture media, as the tendency to produce a uniform color is much stronger. If, therefore, the germs sent to Billings by Detmers were colored entirely, that is the proper and only possible indication that the "tincture" had been too strongly applied. He goes so far as to admit, however, that "sometimes there does seem to be a very slight clear space in the middle of the body," but he is careful to add that "in no way does it resemble Mr. Salmon's description or plates." It would have been interesting if he had pointed out how a clear space could exist in the middle of a germ and still not resemble in any way another clear space located in the same position in another germ.

These inconsistencies show that the whole argument lacks candor or even a desire to reach the truth.

It may be freely admitted with Frosch, and as we have shown in our reports, that this germ in common with many others varies greatly even in its staining properties when obtained from different outbreaks, or when grown under different conditions. The same is true of the swine-plague germ. This, however, does not prevent each from having its peculiar staining, which is valuable as a diagnostic point when taken in connection with other morphological and biological characters, but which alone is not sufficient to determine a species.

That the figures of the hog-cholera germ in our reports do vary somewhat as to the staining, as charged by Frosch, is not denied, but he surely is the last one to consider this as bearing against the value of our statements, for he expressly calls attention to the variations which are liable to occur, and to the delicacy of the manipulations necessary to get comparative results.

Our figures were drawn from the natural objects, and were correctly drawn. If they had been diagrammatic plates, such as adorn Billings's reports, then an exact correspondence might have been expected. In spite of the variations, however, the difference in staining between the hog-cholera and swine-plague germs is very apparent in our plates, and can be relied upon as exact.

With organisms which vary in many of their characters to the extent which occurs in bacteria from slight changes in the conditions of life, it goes without saying that it requires skill to secure typical preparations, and even then such are not to be expected from all outbreaks. For that reason a safe diagnosis cannot be made from a single character, and above all is it unsafe and unscientific to reach positive conclusions from the simple microscopical inspection of a preparation the germs of which have been cultivated, stained, and mounted by another person.

The examples of Billings's recklessness in this respect and of his discomfiture are numerous and instructive. Dr. Shakespeare, previous to his appointment on the Commission of Inquiry, sent him a photograph of a certain micro-organism and inquired if it resembled the germ found by him in the swine plague of Nebraska. Billings at once accepted it as identical with his swine-plague germ, showed it among his friends and wrote it up in the newspapers as another proof of the correctness of his own conclusions and the incompetency of the Bureau. When the Commission reached Lincoln the

members were invited to meet a number of scientists and people connected with the University, and at this gathering Billings made an address. Among other things he made a strong point of the confirmation which his work had received from the investigations of Shakespeare, and exhibited the photograph as proof positive that the latter had isolated the same germ from hog cholera which he himself claimed to be the cause of that disease. To no one was this greater news or more of a surprise than to Shakespeare himself, who was obliged in self-defence to explain that the germ in question was not obtained from a sick hog, but from a person affected with some bowel disorder, and he had no reason to suppose it had any relation to any swine disease.

His alleged discovery of the germ of yellow fever is only another example of the same ridiculous blundering. He claimed to have found the organism described by Babes, in 1885, in specimens from seven cases of yellow fever, and that in only one case was there any pollution. Of these investigations he wrote: "I am willing to risk some considerable reputation that the germ herein described as present in all this material is the specific cause of yellow fever, as well as that the description of the morpho-biological phenomena presented by the germ of the Southern cattle plague will largely be found applicable to this." (*Original Investigations of Cattle Diseases in Nebraska*, 1886-1889, p. 116.)

Now, what are the facts about this? In his recent report, Sternberg gives a history of this material and of the results of a careful examination of it by different experts. The bacillus of Babes, alleged by Billings to be present "in every section and in great numbers," is conclusively shown to have been absent from the specimens which he referred to with greatest confidence, and probably did not exist in any of the specimens which he examined. These specimens did contain the bacterium coli commune and other organisms which represented a post-mortem invasion of the tissue. (*Report on the Etiology and Prevention of Yellow Fever*, by George M. Sternberg, Washington, 1890, pp. 176-180.) His identification of the Babes germ is, therefore, on a par with his identification of his swine-plague germ in the photograph sent him by Shakespeare, and his much-vaunted yellow fever investigations turn out to be a farce of the most absurd character.

To come back to Billings's opinion of the slide sent him by Detmers, it can be seen that it was formed with the same kind of evidence as his opinion of the Shakespeare photograph and of the yellow-fever

germs. As evidence of the kind of germ, this opinion, from the nature of the case, can have no weight, but as evidence of the care or lack of care shown in reaching his conclusion it is incontestable.

Detmers, who studied the germ from which this slide was made both in cultures and by the inoculation of a rabbit, decided that it was entirely different from his swine plague; and, as Frosch remarks, "on the very remarkable ground that the post-mortem lesions found in the rabbit were not like those he was accustomed to see in pigs." Detmers and Billings were both positive on two points; first, that their swine plagues were identical, and second, that this germ discovered by the Bureau was entirely unlike the germ of their disease.

Detmers said: "I cannot identify it with swine plague. If it is identical with it, then I must say the disease I heretofore pronounced swine plague, or, as the farmers call it, hog cholera, must be bogus; that is, something else. I am compelled to pronounce the disease of which the rabbit died a fatal septic disease entirely different from swine plague." Again, he says of the disease produced by this germ, "It is a septic germ, readily kills rabbits and causes septicæmia, but has no connection with the disease in question. It is not for me to say where Dr. Salmon obtained it or from where he may have imported it." (*Billings's Report on Swine Plague*, pp. 249 and 257.)

Billings himself took the same ground, for he remarked: "Swine plague itself being a septicæmia, may it not be possible that Mr. Salmon has accidentally dropped upon some kind of a septic organism capable of producing the same lesions?"

"This question has been frequently in my mind of late, for if not so, I do not know how to answer for all Mr. Salmon's wonderfully positive experiments. If not so, then these experiments were never made, and the whole thing is a concocted farce, or else he has been secretly using the real germ and showing people this other thing. I am determined to force this question to such an issue that the real facts must come out sooner or later, for I, as repeatedly said, have no fears but what my own work will stand every test." (*Loc. cit.*, p. 249.)

Here are the two positions. Which side was correct? The investigations of von Esmarch, Frosch, Bunzl-Federn, Raccuglia, Afanassieff, and others leave no doubt as to the reality and pathogenic effect of our hog-cholera germ? Billings himself has since adopted it; but what microbe did he and Detmers have at the time they were making such charges against the Bureau? Surely, if they had ever seen the hog-cholera germ they would have recognized it in this culture, which

Detmers obtained from Persh. If they had not seen it, then what becomes of the claim made by them both that Detmers is entitled to the credit of its original discovery?

I do not propose at this time to follow these critics through any more of their inconsistent and contradictory writings. I have done this much to show you the quality of the investigations which are held up to you, because they are "recognized as good abroad, and cannot be ignored at home." If the general conclusions of a man's investigations are so absolutely wrong, how can the details upon which these are founded be any nearer right? We might and should excuse errors or apparent errors of detail; but how can you accept a work which is wrong in its principal conclusions?

The principal conclusions of the Bureau reports as to the existence of the hog-cholera and swine-plague germs in this country have been confirmed on all sides. The doubts of European investigators as to the correctness of these conclusions have been withdrawn. What discoveries of value have been made regarding the biology of the hog-cholera or swine-plague germs by other American investigators and have been satisfactorily confirmed? If, on the other hand, you compare the report of Frosch with the Bureau reports you cannot fail to observe how many of his conclusions were previously announced in our reports.

Does this Association take no pride in the investigations of the Bureau of Animal Industry, or does it propose to stigmatize them as a disgrace to the veterinary profession? Is it willing to brand them as discreditable and the men connected with them as ignorant, incompetent, and dishonest on the evidence which has been submitted? Do you forget that Billings has vilified about every scientist whose reputation might serve him as a stepping-stone if he could once get it under his feet?

Why, then, are these reports of his which contain no discoveries of value, if they contain any discoveries at all, reports which are filled with the most brutal personalities, which give no account of experiments conducted in a scientific manner, which are lacking in those details necessary for their confirmation by other investigators, which, above all, are manifestly wrong in their principal conclusions; why are these reports now held up before us as too good to be ignored, and the reports of the Bureau of Animal Industry, written in part by members of this Association, denounced as they have been? Are you aware that this report of our committee was no sooner published than it was circulated broadcast by Billings as another vindication

of his work and his methods? Do you not know that he is repeating with Texas fever the rôle which he played with swine diseases—denying the existence of the true germ and claiming the discovery of something else? Why should this Association go out of its way to assist such a man in obstructing the progress of science and in vilifying its own members?

Gentlemen, I leave the matter with you, knowing that my own work has been carefully and conscientiously performed, and with the full confidence that every detail in the work of my scientific assistants has been done with equal care and honesty. It is for you to decide whether such reports from one of our leading committees are to be indorsed and encouraged. I express no opinion as to the honesty of the committee, but I do charge that its report was incorrect in both its statements and its conclusions, and inexcusable in its personalities. I do insist that this Association cannot afford to indorse such a report, or to allow others like it to be presented in the future, whether they affect me or any other member of this Association. The truth will finally prevail, no matter what our action may be; but if such mischievous reports continue to come from leading committees you will be responsible for the loss of prestige and influence to the Association, and the loss of good-will between members, which must necessarily follow.

STRONGYLUS ARMATUS.

By J. F. WINCHESTER, V.S.

SYNONYMS.—Armed sclerostome: *Sclerostoma equinum*; Palisade worm; Armed strongyle.

This parasite is a nematoid of the genera *strongylus*. The term "nematoid" derives its origin from the Greek word "nema," signifying "a thread;" the term *strongylus* meaning round or cylindrical.

In presenting this subject to you I do not want to convey the idea that it is a new subject or of recent origin. I simply desire that it may renew its youth, and to establish the fact that this condition does exist in other localities than on the Continent. Judging from the literature in English on this subject, it has certainly been overlooked, for, with a few exceptions, only cases are reported that are interesting on account of their grossness.

Owing to these facts, it has been necessary for me to obtain the greater part of the literature from Continental authors. Finding that to be the case, I have had the able assistance of Dr. J. M. Parker, of Haverhill, in order that a part of the investigation might be original work. To him we are indebted for several original drawings, the enlarged plates from Neumann, mounted specimens, revised description of the parasite, besides several post-mortem reports of horses that had lesions due to this nematoid.

At this point it might be well to state that in man, according to Prof. W. F. Whitney, of Harvard Medical School, aneurisms due to a nematoid, have never been found.

HISTORY.

A knowledge of these parasites goes back to the seventeenth century. In 1655 Ruysch discovered in an aneurism of the mesenteric artery of a horse an innumerable quantity of small worms, and

later he published three or four similar observations. Schultze in 1725, Chobert, in 1782, recorded similar instances, and since then such observations have been greatly multiplied, principally by Rudolphi, Hodgson, Greve, Rigot, and many others, including English and American veterinarians. Bollinger has made an attentive study of this parasitism, and in following it out has definitely established its essential points.

These verminous aneurisms have only been found in the equidæ, and, according to Neumann, more frequent in the ass than the horse.

Hering asserted that, except in young foals, it is rare to find a horse without aneurismal dilatation; and Bollinger estimated that from 69 to 94 per cent. of adult horses were so affected.

They are found principally in the large mesenteric artery and its branches, although it is found in the other arteries.

DESCRIPTION OF PARASITE.

ARMED SCLEROSTOME.—Body gray, or brown, shaded with red; straight, rigid, the anterior part being broader than that which immediately follows. See Plate I. "Mouth orbicular, widely open, and rendered tense by several chitinous concentric rings, the innermost of which are garnished by fine teeth, while the outermost carry six papillæ symmetrically divided." (On the outermost ring there is, also, a fringe of what appear like long, slender, sharp-pointed cilia; these are not seen when the mouth is closed; they are best shown by pressing on the cover glass, and so pressing the air out of the mouth, causing the cilia to spread outward. The six papillæ mentioned by Neumann are sharp spicules, and are curved inward, hooklike, and probably serve the purpose of attaching the worm to the mucous membrane.) "The buccal capsule is sustained by a dorsal longitudinal line or rib, and has at the bottom two round, sharp plates." (Opening out of the mouth is the pharyngeal capsule, which is armed anteriorly, and is funnel-shaped, the posterior opening being the smaller. The anterior portion of the œsophagus is constricted and narrow for about a third of its length, when it begins to expand, forming the posterior ventricle or bulb.)

"The caudal pouch of the male is almost trilobate, the posterior ribs being trifurcated, the middle double, and the anterior cleft." From the anterior portion of the pouch the spicula, or male genital organ projects. It is first divided into two parts (deferens canals), which afterward unite toward the extremity.

"The female" (which is much thicker and larger than the male) "has the tail obtuse, and the vulva situated in the posterior moiety of the body," (and is surrounded by a roughened circular surface of a reddish-brown color, which is grasped by the caudal pouch of the male during copulation. The uterus occupies a large part of the body; it can be made out very readily by the ova, which are usually present in large numbers.)

"The eggs are ovoid, and measure 92μ long, and 54μ broad. The dimensions are variable; sometimes the males are 18 mm. to 20 mm. long, and the females 20 mm. to 26 mm., and at other times they are respectively 26 mm. to 35 mm. and 35 mm. to 55 mm. (The worms are found in an agamous or undeveloped state, in the blood-vessels. Plate II. In this condition they are covered by a thin, transparent membrane, which entirely covers and incloses the still undeveloped worm. It has a temporary mouth and œsophagus, which lead directly into the still imperfectly formed mouth.)"

This worm infests the cæcum and commencement of the large colon, and—with the *ascaris megacephala*—is the worm most commonly found in the equidæ.

The armed sclerostome holds firmly by the buccal armature to the mucous membrane, which forms at the point of adherence a small dark prominence. They are frequently met with in couples—the two individuals forming an almost right angle, and adhering so intimately that they may be preserved in this condition in alcohol.

Notwithstanding their sometimes considerable numbers, and the irritation they should produce in the mucous membrane, their presence in the horse is rarely betrayed by any appreciable symptom. They have sometimes been accused of causing death by anæmia, diarrhœa, colic, etc.

It is not only on the internal surface of the large intestine that they are met with, for they are found in aneurisms of the mesenteric artery, and in the hepatic, renal, spermatic, occipital and other arteries; in the muscles, pancreas (Goubaux, Montane), ligaments of the liver, and in submucous cysts of the cæcum, and sometimes of the duodenum. In all these instances they are in an agamous state, and represent one of the phases in the development of the species.

With regard to the intestinal tumors, their volume varies from that of the head of a pin to that of a hazel- or small almond-nut, according to the development attained by the worm inside each tumor. The latter also contains altered blood or pus, and there is more or less hyperæmia around the circumference. The worm within

is rolled upon itself, and is, of course, of variable dimensions—sometimes extremely fine, and never so large as in the adult state; it is always destitute of reproductive organs.

Occasionally there is no worm in the tumor, and then there is seen a small opening at the summit, by which it has escaped. The worms found in the organs mentioned above are also agamous; they represent the primary phase of development, as they do not become sexualized except in the cæcum and colon.

Colin states that the armed sclerostomes are worms which migrate internally, and that their development is effected almost in one place. The ova are deposited in the substance of the intestinal mucous membrane—perhaps in the punctures produced by the mouth of the female, or perhaps merely in the orifices of the glands—and they are hatched there, the embryos becoming encysted at the points where they are hatched, in the cyst developed by their presence.

After being developed and having undergone several moultings, they make their exit from the cyst, and fix themselves on the surface of the mucous membrane; though a certain number remain in their cyst, grow there, have the genital organs partly formed, but nevertheless always remain agamous. Those found in aneurisms and in the peri-intestinal organs must have entered the bloodvessels on their leaving the cyst, and in this way be carried—by a centrifugal migration—to the parts where they are found.

Railliet has shown that this is not the ordinary mode of reproduction and development of the sclerostomes. The ova are expelled along with the feces, and become hatched in a few days if they are in a damp place. The embryos that issue from them are cylindroid, a third or a fourth of a millimetre long, somewhat obtuse in front, and have a filiform tail. If the conditions of humidity continue to be favorable, they gradually grow, their integument becomes folded and forms a kind of sheath in which the worm moults in an evident manner. Railliet has been able to keep them several months in this state, or after complete moulting. It is at this period that they enter the body of the horse in the water the animal drinks (or perhaps on green forage), undergo moulting if they have not already done so, and penetrate the substance of the mucous membrane. Leuckart asserts that the embryos should pass through an intermediate host before entering the intestine of the horse. But, however this may be, it is possible that after they have lodged themselves in the mucous membrane a small number of embryos stay to fix themselves in the cysts which they cause to be formed. The majority reach the circulatory

system, and install themselves in the abdominal arteries—principally at the origin of the great mesenteric; there they form aneurismal dilatations, filled with a ragged clot that adheres to the inner surface of the vessel, and in this the helminths are located.

After an indefinite sojourn in the aneurism, the worms leave it by allowing themselves to be carried by the blood, and in the course of time reach the cæcum, where they form the majority, if not the whole, of the submucous cysts. Their last migration is, therefore, in reality, centripetal.

Finally, after remaining a more or less considerable time in the tumor they had caused the formation of, and having grown, the sclerostomes forsake it, attach themselves to the mucous membranes, becomes sexualized, and copulate.

An interesting observation of Railliet gives support to this theory as to the development of the sclerostomes. He found in a horse a considerable quantity of these worms in the cæcum, verminous cysts in the walls of that viscus, and a smaller number in the duodenum and other parts of the small intestine.

The cysts in the duodenum—which are rare—were grouped on the small curvature of the intestine, and some were even observed disseminated in the mesentery. All of the latter contained sclerostomes still agamous; but several of those in the small intestines—like those of the cæcum—had an opening in their centre and were vacant, the helminths having left them. This would seem to prove that the worms had reached the intestines by way of the arteries.

These verminous aneurisms have only been seen in the equidæ—horse, ass, mule, and hemione.

According to Semmer, at Dorpat all the foals, without exception, have verminous aneurisms. Mather has witnessed a kind of epizooty break out among foals, consisting of verminous aneurisms of the aorta, near the origin of the renal arteries.

These aneurisms are only seen on certain visceral branches of the posterior aorta, and exceptionally on the posterior aorta itself. In 65 horses, Hering has noted aneurism of the trunk of the great mesenteric artery in 7 cases; the cœliac artery in 59 cases; the cœcal artery in 18 cases; the artery of the small intestine in 16 cases; the small mesenteric artery in 2 cases; the cœliac trunk in 2 cases; the hepatic artery in 3 cases; and in the renal artery 1 case. It is not uncommon to find more than one aneurism in the same horse.

In 35 horses, Bollinger counted 60 aneurisms; and in adding these to the 108 seen by Hering in 65 horses, he reckoned that in 100

horses there were 168 aneurisms, of which 153 were in the large mesenteric artery and its branches, 4 in the cœliac trunk, 3 in the hepatic artery, 3 in the small mesenteric artery, 3 in the renal arteries, and 2 in the posterior aorta. In 100 horses, 90 to 94 had one or more verminous aneurisms. Sclerostomes were also several times found in the spermatic artery, and on three occasions in the cerebral arteries. Lastly, Roll indicates them as being found in the vena cava, and, according to Valentine, a specimen was discovered in the vena portæ, at the Berne veterinary school.

The young form of the armed sclerostome—the aneurismal sclerostome—is found in various arteries in the horse, and those of the brain are not exempt. Three observations have been published.

Albrecht reports the case of a horse which, during work, suddenly began to stagger; the eyes were fixed, and the respiration was noisy; there were remissions and relapses. Three hours after the first symptoms appeared the head was carried low and inclined to the left, and there were convulsive movements of the neck and limbs. Soon it fell on the left side, became unconscious, and manifested complete insensibility. In this state it was killed, and at the autopsy there were found diffuse meningitis, hemorrhagic encephalitis, and in the middle lobe of the cerebellum a sclerostome, which had probably arrived there when an embryo. Van Heill saw a three-year-old horse, which was suddenly attacked with furious vertigo, that lasted about a quarter of an hour. An autopsy revealed congestion of the brain and choroid plexus, while a free sclerostome was lodged in the cortical substance of the right hemisphere. LeBihan found another worm of this kind in the occipital artery; rupture of the aneurism caused the death of the horse in less than ten minutes.

Abildgaard discovered the *filaria equinæ* between the dura mater and cranial arachnoid of a horse.

The agamous form of this worm has been encountered more frequently in the spermatic than in the renal arteries of the horse. Gurlt had already noticed the presence of these worms in the vaginal sheath. Aitkin once saw an armed sclerostome in the spermatic artery of a foal, and Baird found one in the testicle of a horse. Clancy met with thirteen on the surface of the testicle of a three-year-old horse; the gland was indurated, and the envelopes infiltrated. Brodie published a similar case. At the London Veterinary College one worm was found in the spermatic artery of the ass, and another in a funiculitis consecutive to castration. It is remarkable the frequency with which these worms occur in the abnormal

testicles of horses affected with abdominal cryptorchidism. We met with a case of this kind in May, 1883; and Simonin and Jacoulet encountered three in the space of two months, the testicles having undergone fibrous degeneration. On incising the testicle of a cryptorchid which was normal in structure, Degive met with an armed sclerostome. It would be interesting to ascertain the relation in frequency between cryptorchidism and testicular parasitism. What is certain is that the concealed testicles of horses affected with abdominal cryptorchidism often exhibit such alterations as fibrous tumors or serous cysts.

In stallions affected with hydrocele, Schmidt and Pottinger have remarked one or two specimens of this worm in the vaginal sheath. Their presence is easily explained by the communication that exists between the abdominal cavity and that sheath.

PATHOLOGICAL ANATOMY.—The verminous aneurism is usually fusiform, sometimes globular or cylindroid. Its average size is about that of a walnut; though it may not exceed that of a pea, or it may attain the dimensions of a man's head.

It consists of a dilatation of the affected artery; with hypertrophy of its walls. The dilatation is sometimes absent, notwithstanding grave thrombic lesions in the vessel (Durieux.)

The external tunic is usually thickened and variably indurated, according to the age of the tumor. It adheres firmly to the neighboring parts, and is more or less confounded with the connective tissue.

The middle tunic is always hypertrophied, and sometimes very much so. Its thickness—which is ordinarily about a millimetre—may attain, and even exceed, two centimetres. At one time this thickening is due to simple hypertrophy of the tunic; at another time it is owing to inflammatory phenomena, with atrophy of the muscular fibres.

The internal tunic is nearly always altered. It may present every degree of endarteritis and of regressive metamorphosis—from partial thickenings, and a white milky tint, to ulceration, atheromatous transformation, and calcification; this latter, however, is always rare, and may exceptionally assume an aspect of real ossification.

In the interior of the aneurism there is usually a fibrinous deposit—a thrombus—always adhering, though to a variable degree, to the internal membrane. It is more or less regular and consistent, and partially blocks the vessels; but there is always a canal in the middle for the passage of blood. This thrombus is often prolonged in the

artery beyond the aneurism, both before and behind ; and its external layers are capable of becoming organized and undergoing softening. Its formation is essentially connected with the presence of the worms, the inflammatory processes—ulcerative and regressive—in the internal tunic, and the dilatation of the vessel. Decroly has published a remarkable case in which the alteration in the aorta extended from the heart to the lumbar region.

In the aneurism worms are found in nine cases out of ten ; their average number is from 9 to 11 and they vary between 2 and 121. When they are absent, the lesions have a chronic character ; but when they are present, then these are more or less acute. The parasites are young armed sclerostomes. They are rose-tinted, and their average length is from 1 to 3 cm. ; their sexual characters are already well defined, but their genital organs remain rudimentary. They undergo one moulting in this situation, in which their buccal armature assumes its definite character. Rayer and Diesing, who erroneously considered them as a distinct variety, named them, the former the *strongylus armatus minor*, and the latter the *sclerostoma armatum aneurysmaticum*.

Amongst the aneurismal sclerostomes, some are almost free in the cavity of the artery ; but the majority are more or less concealed in the layers of the thrombus, the head or tail usually projecting into the blood-stream. They are also found in the hypertrophied walls of the artery, in either the internal or middle coats, or between these two. Sometimes nothing is found of them except the integuments they left after their final moulting.

The gravity of verminous aneurisms is due to the risk of rupture of the vessels, and more especially—as Bollinger has pointed out—to their influence on the frequency and seriousness of colics.

The clot formed in the interior of the great mesenteric or other arteries liable to these aneurisms may throw off one or more fragments, which are carried by the blood, and constitute so many emboli in the arterial ramifications passing to the intestine. According to the size of the embolus, the obliterated artery is itself more or less voluminous, and the disturbance set up more or less serious ; there is sudden anæmia or ischæmia of that portion of the intestine to which the artery is distributed, and consequently paralysis of one or more of the sections of the digestive tube, the secretions and movements of which are suspended. Cohn and Panum have shown experimentally, in fact, that such are the results of embolism of the great mesenteric artery. The ischæmic portion of the intestine becomes at first pale,

then of a dark-red color ; the mucous membrane is swollen, there are hemorrhagic infarcts, serous exudates, ecchymoses, and sometimes a considerable increase of the organ in volume.

These phenomena, which are almost immediately consecutive, are related to the total absence of pressure in the capillaries of the artery, and even in the venous trunk succeeding them, as far as the next venule, where the circulation can go on freely. The blood flows from this point toward the capillaries, where the tension is nearly nil, and soon causes engorgement, and even small hemorrhages. In consequence of all this disturbance, there are colics, which rapidly disappear if the obstructed artery is of small calibre ; for the collaterals soon supplement it. The duration of these colics depends upon the facility with which this collateral circulation can be effected. It is sometimes easier in a large branch nearer the trunk of emergence, and this explains why an attack of colic that appears very serious will quickly disappear.

Otherwise, the establishment of the collateral circulation plays an important part in the post-ischæmic hyperæmia ; and this collateral or compensatory hyperæmia is related to the increase of blood-pressure in the vessels adjoining the obliterated one, as Feltz has shown. When it does not produce irreparable lesions the equilibrium is quickly restored, and all trouble disappears.

The circulation disturbances of the intestine cause a local paralysis in it, stagnation, and consequent fermentation of its contents, with an abundant production of gas. The enteralgia induced in the healthy portions causes energetic contractions, which frequently lead to volvulus and invaginations. Friedberger and Frohner have often observed the rotation on its axis of the left part of the large colon—that is, its free portion—which is, of all the intestinal divisions, the most liable to thromboses and embolisms. Paralysis of the intestine often brings about rupture of it, the stomach, or the diaphragm, owing to fermentation and enormous accumulation of matter and gas therein.

In animals which have been cured of colic for some time, old lesions in the form of thromboses are often found in branches of the great mesenteric artery, as well as in the corresponding veins, these vessels being partially or totally obliterated, and around them pigmentation of the peritoneum and other organs is usually observed. Bolinger says that on a square centimetre of surface there are sometimes found five or six arterioles or veinules so obliterated.

At the autopsy of horses which have died from colic it is often

difficult to discover the obliterated artery and the seat of the embolus, because of the great development of the intestinal vessels, and more especially on account of their congested condition, so that much care and patience are needed in this search.

The effects of the aneurisms—the thromboses and the embolisms—are evidently subordinate to their situation. The presence alone of the aneurism and its clot reduces the calibre of the great mesenteric artery, and consequently diminishes the supply of blood to the intestine; this is sufficient to explain the chronic indigestion troubles observed, and these effects are all the more marked if the diminution in the lumen is extended to a ramification; but they are especially so if the vessel becomes completely obstructed by a detached fragment of the thrombus. But as the arteries of the same intestine anastomose freely by inosculation close to the concave curvature of the organ, embolism of one of the vessels is never a fatal accident. It is the same with obliteration of one of the two cæcal arteries; for the other which anastomoses with it near the point of the cæcum can assume its function, so that the attacks of colic pass off. But if the trunk of the right fasciculus of the great mesenteric artery is completely obstructed, the cæcum does not receive any blood, and death quickly ensues. The large colon receives its blood by the two colic arteries, which have an independent origin; so that it seldom happens that both are blocked at the same time.

The floating colon would be exempt from the danger of aneurismal embolism but for its first artery, which is derived from the great mesenteric; the other arteries arise from the small mesenteric, in which aneurism is rare.

In cases of death from aneurisms, the alterations described above are most frequently found. There may also be rupture of a verminous aneurism and abdominal hemorrhage. But as Friedberger and Frohner have remarked, embolic colics may terminate in death in twelve to twenty-four hours, and before serious intestinal alterations have had time to occur. The intestine is in such cases usually very distended by gas, and obstructed.

Verminous aneurisms rarely give rise to characteristic symptoms, and their presence is often only recognized when rupture has taken place, which rapidly terminates in death from internal hemorrhage. On the occurrence of this accident, which coincides ordinarily with a severe effort, the animal crouches or sits on its hind-quarters, knuckles over at the fetlock-joints, and falls as if struck with paraplegia; the pulse is thready, limbs cold, visible mucous membranes blanched,

etc.; and, generally, the last moments of life are marked by signs of profound and violent suffering. Aneurisms of the aorta appear to be more liable to rupture than those of the great mesenteric artery. As a rule, the blood flows into the peritoneal cavity, but sometimes rupture takes place directly into the intestinal canal. In eighteen cases collected by Bollinger, fifteen were of rupture into the abdominal cavity, and three into the intestine. The latter result might be recognized sometimes from the presence of blood which impregnates the feces passed before death.

Rupture of verminous aneurisms is attributable to the feeble resistance of their walls—which have lost their elasticity and contractility—and to the increased arterial pressure resulting from diminution in the lumen of the vessel.

Besides the cases of rapid death, there have been noted—as symptoms of aneurism of the posterior aorta—decrease in vigor of the animal, stiffness in movement of the hind-quarters, difficulty and pain in micturition, arching of the loins, infiltration and intermittent lameness of one or both hind-limbs, cramps and signs of paraplegia; but these indications are not sufficiently characteristic to afford a sure diagnosis, though they may arouse suspicions, which will sometimes be confirmed by a rectal exploration.

Attacks of colic are the most frequent sign of verminous aneurism, and are the consequence of embolism in the branches of the diseased vessels; but neither are these symptoms characteristic. Sometimes the colic is sudden and acute, and disappears in a short time, to reappear after a variable interval; it depends upon local obstruction, which is soon compensated for by neighboring anastomoses, and is usually ascribed to indigestion, as there is no appreciable cause. In other cases the colics are subacute and a little painful, and are due to sudden paralysis of a portion of the intestine. Death soon follows. Or the disease runs a chronic course, and is characterized by difficult digestion, constipation alternating with diarrhoea, slight colic, some fever, and a capricious appetite; it is a kind of intestinal catarrh, that may continue for some days, or even weeks, and terminates either in recovery or—which is more frequent—by marasmus, cachexia, and death.

Lastly, in some cases the embolic obstruction of the small arteries of the intestine—when often repeated—ends in hemorrhagic enteritis, to which the animal succumbs in several days or weeks. Friedberger and Frohner attribute to this state the following symptoms; Diminution of appetite or complete inappetence, increased thirst, and

rare defecation; the fecal pellets are small and dry at first, then become soft, pasty, and later, sanguinolent and fetid; the urine is acid and rich in phosphates; the fever is intense and persistent, and the pulse small and quick; the general debility increases, the animals become emaciated and the abdomen retracted; and now and again there is coma. Frequently, after feeding there is general aggravation of the symptoms and colic. Death is often ushered in by febrile paroxysms, muscular tremors, shivering, coldness of the limbs, pallor of the mucous membranes, quickened, difficult, and rattling respiration, tumultuous beating of the heart, and considerable elevation of the rectal temperature.

To sum up, colics which have their origin in disturbance of the circulation, have no particular signs which would allow them to be distinguished with sufficient precision in the complex group of abdominal complaints.

During the series of years that I have been in practice the subject and treatment of colic in horses has been most unsatisfactory to me, and the literature of our text-books would not satisfactorily come to my aid. Why, I have often asked myself, do horses become subjects of colic? Why do they, as a rule, succumb after several attacks? Why do those attacks, as a rule, become more severe until the last, when they die? Why is it that the usual stereotyped colic-drench or bolus will relieve, and then again it does not produce any impression whatever, apparently? Why is it that a case of colic recovers without any notice being taken of it?

Knowing that there is never an effect without a cause, I began to make my post-mortem examinations with more care, and open some of the leaves of the book of Nature that I had been in the habit of passing over. The result of this closer observation revealed to me the fact that the vessels supplying the intestines with blood were frequently abnormal and showed aneurisms. Opening these dilations I found parasites, nematoids, and, by referring to Cobbold, found that they were well known.

The question then presented itself to my mind, Are we, as a body of practitioners, less observing than those gone before us? Do we look wise, give a decided opinion upon some everyday occurrence in practice, with the positiveness, as probably has been done in colics, and know as little about the cause and lesions produced? Are we not, as a body of veterinarians, more inclined to open the book of charges than that of Nature? Do not think for a moment that I would in the least underrate the worth or the honesty of the mem-

bers of this profession. I think the fault lies, if there is any, with the authors of our standard works. In this particular instance the subject cannot be said to be spoken of at all, and in one instance the author in referring to it, states that it does not occur in this country (England), although it appears quite frequently in Germany.

In referring to the journals of the present day (in English) one can almost count the articles on this subject on his hand, and, that being the case, I came to the conclusion there must be a few veterinarians that are not aware of the importance of this subject.

The examinations and investigations I have made in this subject, with the able assistance of J. M. Parker, of Haverhill, only again very forcibly bring to my mind the fact that we must not take too much for granted, but make original inquiry for ourselves. It is not necessary that all the work shall have to be done with the microscope. Is it not a fact, that in making post-mortem examinations we only look for a condition that, in our opinion, would cause death, and never once think enough about it to look and try to find out if there is a tangible cause for the effect produced. How often have we made a post-mortem examination and been unable to find lesions that would satisfactorily explain the cause of death, when, possibly, by a closer examination the cause might have shown itself?

Certainly there must be cause for this laxity in our post-mortem examinations, and I am inclined to think that, perhaps, the principal cause may be laid at the door of our instructors in a great many instances; but oftentimes the pressure of business is the cause.

Can we afford to allow the coming generations of veterinarians to look back upon us as not having the same powers of observation as the generation gone before us? Why is it that the Continental literature is so much more instructive than the rest? The articles on record regarding this malady are interesting, but, with the exception of Dr. W. L. Williams's they are confined to unusual cases, where the parasites are very numerous, or the lesions gross. In Dr. W. L. Williams's article the several cases he cites are in animals that had been in pasture and the season wet, thus favoring, according to the available life history of the *S. armatus*, the development of the worms. From my observation, it is not necessary that the animal should have been in pasture in order to harbor this worm, or at least within a few years. I am of the opinion that in the larger majority of deaths from colic there will be found in the bloodvessels evidence of or the parasite itself.

It is not to the exceptional cases that I desire to call your attention, but to those of every day occurrence.

The following cases may be of interest at this point as giving direct evidence, in my opinion, that the worm in question does produce lesions that are a cause of embolism; that the parasite is a cause of altered nutrition, and in many cases the cause of death.

I will, also, cite several cases from the pen of Dr. Parker which, I think, sustain the position taken on this subject.

1. Brown Gelding. Ten years; 1000 pounds.

History.—Same owner for two years; never sick before with present owner. Found the animal with abdominal pain, sharp and remittent. Urine free, feces scant. Looks round to the flank continually; eructation of gas from stomach. Treatment would relieve for a while, but after twelve hours sickness he died.

Post-mortem, twelve hours after death.—Bloated; dark colored serum escapes from the abdomen when opened. The large intestines normal in color, but distended with gas. Small intestine black for a distance of about four feet, due to a twist. Rest of viscera normal. On opening the anterior mesenteric artery found a thickening of the intestine, with a new growth ragged, in which were found worms.

2. Brown Gelding. Six years; 1400 pounds.

History.—This animal has been subject to fainting spells during the last four months. He would fall down, lay a few minutes, get up, apparently all right, and resume his work for several weeks or days.

This day he went to work apparently well, but soon manifested pain, which gradually increased, with periods of ease, until noon, when death ensued.

I found this animal bloated; in severe pain; pulse and respirations hurried and short. Treatment did not produce any apparent relief, except for a short time.

Post-mortem, four hours afterward.—Bloated; serum escapes when abdomen is opened. The small intestines dark blue, the large black. The veins of mesentery and intestines filled with blood. The mucous membrane of intestines black with blood; the submucous membrane filled with straw-colored serum. The duodenum was contracted on itself for about eight inches, beginning at pyloric orifice. The thoracic cavity contained considerable clear serum; also, the pericardium, which had spots of lymph on its surface. The endocardium dark colored, with apparently calcareous deposits in its substance and on the valves. The superficial bloodvessels of the

brain were filled with blood ; the third ventricle contained some light colored serum, and its plexus was hyperæmic. The anterior mesenteric artery was the seat of an aneurism, the walls being thickened, the intima showing a new ragged growth, which nearly filled its space, and was the seat of several nematoids.

3. Gray Gelding. Eighteen years ; 1450 pounds.

History.—This horse has been subject to attacks of colic during the past three or four years, and would respond to the ordinary treatment readily. Killed on account of lost usefulness.

Autopsy, immediately after death.—Melanotic tumors under tail and along the posterior aorta. Apparently calcareous deposits on the valves of left heart ; otherwise, so far as I could see, was in a normal condition.

Dr. J. M. Parker, of Haverhill, reports the following :

4. Black Gelding ; 1400 pounds.

Was called at 3 P.M. ; found horse thrashing and sweating profusely, and in great pain ; temperature 100° F. ; pulse weak and difficult to get, but about 80 to 90 per minute. Ears and limbs cold ; membranes pale ; eyes wild and anxious ; prognosis unfavorable. Applied hot packs and gave morphia. Temperature gradually rose to 102° F. Pulse more weak and rapid. He breathed hard and sighed occasionally, and trembled, but did not attempt to lie down. These symptoms gradually grew worse until 7.30 P.M., when he died.

Autopsy.—Body tympanitic ; abdominal cavity contained a quantity of serous fluid ; mesenteric bloodvessels filled. Small intestines were, in places, almost black in color ; the serous membrane of the colon, in region of large bloodvessels, showed exudation and extravasation of blood and serum. The mucous membrane was easily torn, and almost black in color, with an exudate of lymph in sub-mucous coat. Thorax and pericardial sac each contained considerable quantity of serum, but seemed otherwise normal. Aorta : The intima was of an even red-rose color, and on opening the anterior mesenteric artery several warty excrescences were found, loosely adherent to the intima. The walls were much thickened, and when cut open a large clot was exposed, and entangled in the clot were several nematoids. The intima of the artery above the clot was of an even red color, while immediately below the clot the membrane was seemingly normal in color.

5. Black Gelding. Sixteen years ; 1050 pounds.

History.—For past two or three years, after having done extra work he would leave his feed, and in course of a week or ten days would again be of service. This A.M. showed symptoms of abdominal trouble, with acute pain, hurried respiration, and quick pulse. He did not get any ease during his sickness, and at times was almost uncontrollable. The duration of sickness was twenty-four hours.

Post-mortem, twelve hours after death.—Bloated; dark colored serum escapes from abdomen when opened; mesentery dark; both the small and large intestines were dark in color, and the mucous membrane of the same was very soft and dark. The contents of intestines very pungent. Kidney was soft; liver dry and hard. Thorax contained quantity of dark fluid. Muscles of heart soft and easily torn. Intima of posterior aorta deep rose color. No evidence of *strongylus armatus* found.

6. Black Gelding. Twelve years; 1150 pounds.

History.—Been subject to colic for some time. Called at 4 A.M. Found him bloated, cold sweat, mucous membranes pale, pulse fast and hard, respirations quick and labored. Died at 9 A.M.

Autopsy, at 4 P.M.—Bloated; serous coat of intestines dark blue, and bloodvessels of mesentery and intestines filled with blood. Mucous membrane of large intestines apoplectic, with exudation of serum into the sub-mucous membrane. Rest of viscera apparently normal. Found aneurism of anterior mesenteric artery; walls thickened; the intima showed a new formation, ragged in appearance, which harbored several worms, and dark colored clots of blood were found below the thrombus.

7. Bay Gelding. Twelve to fourteen years; 1100 pounds.

History.—Sick all day; not much pain; uneasy. At 8 P.M. pulse 36, respiration 18. Slightly bloated; passes flatus easily. No feces since morning. Gave usual treatment and went away. 4 A.M. night man was awakened; went to the horse, which died soon after.

Post-mortem, 11 A.M. same day.—Bloated; on removing abdominal muscles a large quantity of dark-colored serum escaped; undigested food around liver, and stomach, and small intestines. Stomach with small rupture, the edges rough, having clotted blood under external coat of stomach. Small intestines were blushed and contained a quantity of light-colored mucus, sweetish to smell. The mucous membrane of large intestines, colon, and cæcum, was apoplectic, and feces fluid. Liver soft and friable. Rest of viscera apparently normal. The internal lining of anterior mesenteric artery thickened, and presented a cauliflower look covering a space of about

a quarter dollar, which had in its meshes several parasites. Growths were found on bicuspid valves, hard and glistening.

8. Brown Gelding. Nine years; 1100 pounds.

Taken sick 1 A.M. Saw him 3 A.M. and found him bloated; dull pain; up and down. Pulse small, hard and 72. Respiration labored and short; cold sweat; visible mucous membrane pale. Usual treatment, with relief for a while, but gradually failed, until death ensued at 8 A.M.

Post-mortem, at 4 P.M. same day.—Visible mucous membrane pale; bloated; mucus discharge from nose and mouth. Opened abdomen, found peritonitis. The colon, serous coat, dark blue; mucous coat, apoplectic. Small guts, serous coat dark in color; mucus membrane normal. Rest of viscera apparently normal. Left side of heart contained a straw-colored clot. Anterior mesenteric artery aneurismal, containing a cauliflower growth with several small parasites, and beyond this found a firm, dark-colored clot filling artery.

This horse was taken sick with colic the 5th; recovered, went to work the 6th, but had to be returned in a few hours; the 9th he again resumed his work, and continued apparently all right until the morning of the 12th, when he died as above stated.

9. Bay Gelding. Five years; 1050 pounds.

Saw case at 6 P.M. Pulse, full, strong. Respiration a little hurried. Urinates freely; feces plenty. Restless; up and down. Prescribed for him, which gave ease for a while. 9 P.M. bloated; gave drench, slacked away, and remained easy for a while, but continued in dull pain. 1 A.M. the next day, breathing hard and fast; sweating profusely; again relieved him, and he remained comfortable until about 10 A.M., when I repeated the treatment which rendered him comfortable until 4 P.M., when he had a collapse without bloating. Again did my best, which caused him to remain quiet until 4 A.M. of the following day, when he threw himself down, pounding his head and striking with forefeet, while the hind legs remained very stiff until a short time before death, which took place at 7 A.M. the same day.

Post-mortem, thirty hours after death.—Bloated; the abdominal viscera, with the exception of about 18 inches of small colon, were apparently normal. That part of the gut was inflamed and the contents dry. The mucous membrane of cæcum was well covered with dark, raised spots, and contained quite a number of parasites.

One of the branches of the anterior mesenteric artery contained a

growth on its internal surface, which nearly filled its space, and in and around this were found parasites quite active.

10. Brown Gelding. Six years; 1400 pounds.

Taken sick about 5 P.M. Saw him at 6 P.M. Found discharge of undigested food from both nostrils; anxious expression. Pulse full, about 80; mucous membrane of eyes and mouth pale. Breathing short; cold sweat; no bloating to be seen. 8 P.M. bloated; hurried, short breath; pulse imperceptible; cold; mucous membrane of eyes still pale; that of mouth regained color; stands up braced. Tapped; no relief given. Died at 9 P.M.

Autopsy, next day at 11 A.M.—Bloated; part of small colon protruding from anus; opened abdomen, escape of bloody serum and undigested food. Vessels of mesentery full of blood; those of small intestine enlarged. Colon and cæcum apparently normal, as well as kidney, spleen, and liver. Stomach ruptured, with blood and serum under torn edges. The stomach contained quite a number of bots. Small intestines, except part of duodenum, full of bloody serum. Large intestines, contents semi-fluid. Cæcum contained quite a number of parasites—*S. armatus*. Rest of viscera apparently normal. The posterior aorta rose color inside, and clots of blood were given off from the anterior mesenteric artery. Anterior mesenteric artery contained a ragged, new growth, with walls thickened, but did not find a parasite.

Report of cases from the note-book of Dr. J. M. Parker:

Was called June 6th to see a case of colic, and found him presenting the usual symptoms, and no history of having before had colic. He was under treatment for eight days, with days of ease, and apparently convalescing, but death ensued the 15th instant.

Autopsy, the following day.—No bloating; opening the abdominal cavity there was a good deal of post-mortem discoloration. Bowels were full of watery feces. Mucous membrane was excoriated and much inflamed. Diaphragmatic flexure of colon was adherent to abdominal wall, where there was a patch of intense red discoloration, and in the centre was an abscess opening into the walls of the colon, and containing two or three ounces of creamy pus. On examining the aorta and anterior mesenteric artery there was a clot and aneurism of the colic branch of the anterior mesenteric. The colic artery was full of dark-colored blood, and about eight inches down a nematoid was found (*Filaria papillosa*). Immediately below this there was a long, slender, straw-colored ante-mortem clot.

Dr. C. W. Stiles reports on the *Filaria papillosa* as follows :

"This parasite is the *F. Equinæ* (*papillosa*) female. As a rule, the nematoid is found in the body cavity, but it is quite frequently found in the peritoneal cavity, more rarely in the pleural cavity, of the horse, mule, and ass. Generally, only a few specimens are found in one host—occasionally, however, a larger number are found. The females are much more frequent than the male. The same parasite has also been reported from the arachnoid, sub-peritoneal connective tissue, and diaphragm, and the nematoids found in the eye are thought to be embryos of this species."

Baruchello also believes that the nematoids found in the cutaneous helminthiasis of the horse also belong to this species.

12. Roan Mare. Not subject to colic.

Taken on the road ; was very violent, and lived about four hours.

Autopsy, forty-eight hours after.—Portions of small intestines almost black in color ; bloodvessels filled. Walls of anterior mesenteric artery thickened and roughened, with adherent blood-clot, with aneurismal dilatation about size of hen's egg, and entangled in the clot there were several nematoids (*S. armatus*).

13. Kavanagh Mare.

Taken suddenly sick about 2 P.M. (Flatulent colic). Remedies such as chloral hydrate and aromatic spirits of ammonia ; later used turpentine and linseed oil, and carbolic acid, with rectal injections of linseed oil and trocar and canula ; diagnosed twist of bowels. She died about 7.30.

Autopsy, held next day.—Showed abdominal viscera fully distended and tympanitic ; not much inflammation ; no peritonitis. In one place on intestines there was a small patch of hemorrhagic inflammation. The gastro-splenic omentum was intensely inflamed and dark in color. Thoracic viscera: Lungs slightly congested ; heart distended, full. On opening intestines they were found to contain a quantity of liquid feces. Stomach was distended and contained gas and fermented food. Spleen was enormously distended, capsule tense almost to bursting. This distention was especially well marked at the apex, where it was full to bursting. It was here that the gastro-splenic omentum was dark red in color, and intensely injected. On opening the posterior aorta the celiac axis contained a quantity of clotted blood, and in one of the branches the intima was thickened and roughened in places, and adhering to, and partially concealed by, the roughened intima there were several nematoids. The anterior and posterior mesenteric arteries were normal.

14. On August 12th I was sent for to see a mare which I found suffering a good deal of pain and presenting all the symptoms of acute lymphangitis. Temperature $101\frac{1}{2}^{\circ}$; pulse hard and full, and about 60.

Gave linseed oil, with belladonna and veratrum viride, and ordered continuous bathing with hot vinegar and water, and soap and camphor liniment. The next day I got word that she was better; was eating better, and seemed brighter, and the swelling was much reduced. The same evening I got word to come out at once, as the mare was down, unable to get up, and was thrashing badly. I found her lying on her sore leg, trying to get up, and becoming almost frantic in her endeavors. I at once turned her over on her other side, when she got up with little difficulty, and at once began eating hay, and whinnied when water was brought. The following morning, much to my surprise, I received word that she was dead, and I immediately went out to make an autopsy.

Autopsy.—I found body tympanitic, swelling in leg much reduced. Owner said she died easily, without struggling; so much so, that, although he was in the same barn, he did not know she was dead till he went in to look at her. On opening the abdominal cavity there were no lesions to be observed in the abdominal viscera, except one small patch of redness, with a few hemorrhagic spots at the pelvic flexure of the colon. Thorax: the lungs were dark colored and congested. The heart full on both sides. In the anterior mesenteric artery there were two aneurismal dilatations, and in them there were several specimens of the strongylus armatus. In the submucous coat of the cæcum there were several well-marked prominences, and through the thin membrane the coiled up worm could be distinctly seen. Through want of tools and time I did not take out the brain.

15. Horse belonging to American Express Company. Aged. Died suddenly on the street while working. (The day was cool and cloudy.)

The horse fell down "all in a heap," with his legs under him. It got up again, then immediately fell, and died without a struggle.

Autopsy held next day, eighteen hours after death.—Body tympanitic; abdominal organs normal; no parasites in intestines. Thoracic organs; lungs congested; heart empty; muscles dark. Aorta: normal. Kidneys: normal. Brain: on the base of the brain around the pons there was a quantity of congestion and effusion. In the third ventricle there was a teaspoonful of serous effusion. The

bloodvessels in and around the vermiform process and the lateral lobes of the cerebellum were intensely congested. No strongyles were discovered.

Post-mortem of Horses found at the Knacker.

16. Brown Gelding. Aged ; killed.

S. armatus abundant in cæcum ; aneurism anterior mesenteric artery with worms.

17. Gray Mare. Overdriven ; died of exhaustion.

No evidence of *S. armatus* in cæcum ; small aneurism anterior mesenteric artery, but no evidence of parasite there.

18. Owner unknown. Died of colic.

Apoplexy of large intestines. *S. armatus* plenty in cæcum ; anterior mesenteric artery aneurismal, with worms.

19. Bay Gelding. Old, owner unknown ; died of colic.

Aneurism past aorta at point where anterior mesenteric artery is given off, size of large pear, involving anterior mesenteric artery, with thrombus and strongyles present, and one of diverging arteries completely plugged. No *S. armatus* found in cæcum.

20. Bay gelding. Killed for lost usefulness.

Strongyles in cæcum ; aneurism anterior mesenteric artery with thrombus and strongyles.

21. Gray Gelding. Died from effects of heat.

No evidence of parasite in question.

Mr. Mather, M.R.C.V.S., in *Veterinarian* for 1857, vol. xxx. p. 190, writes as follows :

"About twelve months since, when practising in the South, the following cases came under my notice, and never having read in any of our veterinary works, or heard mention made, of such a disease (excepting that veterinary surgeons had occasionally met with it) I thought perhaps you might deem the following particulars not unworthy of a place in the *Veterinarian*.

"It was thus only by chance that I was enabled to learn the nature of the complaint the animals were laboring under, and that in the following manner.

"The subjects of the disease were blood foals, varying in age from seven to sixteen months, and one of them having been found dead in the field, I was sent for to make a post-mortem examination, it being suspected that the animals had been poisoned. On examining the

foal previously to opening it, I found the body to be very much emaciated, and that the abdomen was greatly enlarged. On percussion of the belly, I detected the presence of a small quantity of gas, mingled with a fluid which I concluded was of a serous nature. From this circumstance, I came to the conclusion that the animal had died from ascites, but on opening it, I found the abdomen to contain quite a gallon of pure blood. On removing the viscera I at once saw the hemorrhage had come from a rupture of the posterior aorta, just in front of the renal arteries. I dissected out the vessel to nearly its whole length, and on examining it I thought at first that simple aneurism existed; but on cutting into the dilated portion, near to the rupture, I found—much to my surprise—that the vessel was completely choked with myriads of small worms, similar in appearance to the filaria which we find in the bronchial tubes of calves suffering from bronchitis or husk. The internal coat of the vessel was considerably thickened; in fact, it appeared to be lined with a false membrane, which no doubt had been caused by the irritation set up by these creatures. In all of the arteries given off from the main trunk were more or less of those parasites.

“About a fortnight from the time of being called to this case I was sent for to see another of these foals, which, the man informed me, had been found down and unable to rise.

“On examining it I observed that the pulse at the jaw was nearly imperceptible, the mucous membrane blanched, and the body very cold. I informed the owner that I was sure the foal was dying from internal hemorrhage, and that, in my opinion, it was suffering from the same complaint as the last. We managed, however, after some difficulty to get the animal on his legs again, and immediately we had done so, it commenced voiding a large quantity of blood from the penis. Seeing that there was no chance of recovery, we had the foal destroyed, when I made my examination and found the bladder distended to repletion with blood. The right kidney was twice its normal size, and on cutting into it I found it filled with similar parasites. The renal artery was quite as large as one's finger, and it, also, contained a large number of these creatures. The posterior aorta contained thousands of them.

“Two other foals which were on the premises, I felt sure from their appearance were laboring under the same complaint, and the owner wished me to try if I could do anything for them.

“I must here say, that these foals had been taken off the mares at

about six months old, and placed on some cold, wet, lands, where they had remained up to the time of my seeing them.

"The two surviving ones I had taken up and put into the bay of a barn, so that they could be supplied with crushed oats, pea meal, and good hay. I first gave them for three successive mornings ol. tereb. ʒij; ol. lini. ʒij. and afterward administered for a few days the following tonic: Ferri sulph. ʒss; pulv. gent. ʒj.

"These remedies were alternately employed for a fortnight, and I considered that the animals were improving under their use, but at this time the owner saw fit to dispose of the foals, so that I afterward lost sight of them entirely."

Mr. Mather will find in the records of veterinary medicine several analogous cases to those he has related. They are not uncommon, and have frequently been brought before the notice of the students of the college by the professors.

Dr. W. L. Williams, in his article, says:

"How often these parasitic thrombi occur amongst our horses, we do not attempt to say; we have only looked for strongyles where they have been expected, and have not been disappointed in any case." "A positive diagnosis is generally available, by manual exploration per rectum, or by pulse, and respirations are more uniformly accelerated than in colic, and there is a peculiar, anxious expression about the animal that bodes no good, and leads one to conclude that he is dealing neither with ordinary colic nor enteritis."

I think Dr. Williams is right when he says we do not know how often these parasitic thrombi occur amongst our horses, for the reason that there has never been enough careful post-mortems to answer the question. I am not surprised that he finds them so readily when looking for them, for he says, where expected they were always found.

I must differ with him when he says a positive diagnosis is generally available, by manual exploration per rectum, or pulse, respiration, and general expression of the animal. I think that, in most cases, the diagnosis follows death, although one is justified in expecting the presence of the parasite in the majority of cases that die from colic.

Dr. A. W. Clement in *Journal of Comparative Medicine and Surgery*, vol. xiii., p. 186, cites a very interesting case of rupture of the anterior mesenteric artery, but here the unusual case presents itself.

Dr. J. T. Duncan, in *Veterinary Journal*, March, 1887, cites

several interesting cases that do not correspond to the every-day occurrence of the practitioner, although the lesions produced were due to *S. armatus*.

Dr. R. W. Burke, in *Journal of Comparative Medicine and Surgery*, vol. xiii., has an article on this subject, but does not cite any cases that have come under his observation.

Dr. C. A. Cary, in *Journal of Comparative Medicine and Surgery*, June, 1892, cites two post-mortems of colts that never had colic; one died from tetanus, the other killed on account of malformation, with aneurisms of anterior mesenteric in both, and living sclerostomes. Using these cases for an analogy, he thinks that the theory of verminous aneurisms causing colic should be more carefully looked into.

Mr. M. Laquerriere, in his article on "Colic," *Veterinary Review*, vol. ix. page 222, says: "As to the predisposition produced by a diseased condition of the great mesenteric artery (aneurism), upon which Zundel places so much weight, we attach but little importance to it. But, on the contrary, we recognize the predisposition accompanying advanced age."

Prof. F. Smith, Army Vet. School, Aldershot, has a very interesting article in the *Veterinary Journal*, for July, 1892, on "Intestinal Obstruction in the Horse," and I fail to find that he makes mention of *strongylus armatus* as a cause for the same. He does say that "The rapidity of death depends entirely upon whether the blood supply to the bowel is partly or completely cut off, viz., a partial or complete twist." I am of the opinion that the twist to which he attaches so much importance is a result due to enteralgia, and that due to altered nutrition of the part. It is a fact that this parasite is not a stranger, but is readily found if looked for, and is a cause of thrombosis and embolism.

Mr. Hunting, in discussing Prof. Smith's paper, "held that the impacted food was the cause of the spasm, or the pain, and that the proper thing was to remove the cause, even if it inflicted a little more pain." Does not the establishment of collateral circulation to the afflicted parts cause a return of normal state, and pain then cease, allowing that it is due to an embolism? Who can make a positive diagnosis of this condition during life?

Mr. H. G. Rogers said he was rather skeptical as to the condition called twist, for the report came from Knacker in abdominal cases—"Twist, Sir;" and this is similar to the report from this side of rup-

tured diaphragm. He thought that sluggish liver and defective teeth were the causes of intestinal obstruction.

Prof. Macqueen thought there was another form of obstruction which demanded a little more attention than it usually received, and that was the form of obstruction due to aneurism of the branches of the mesenteric artery. He suggested that more careful post-mortems might reveal a cause that is often overlooked.

Dr. William Willis, M.R.C.V.S., in *Veterinary Record*, July 16, 1892, in criticising Prof. Smith's paper, remarks the entire absence of any reference to the condition of the circulatory apparatus of the bowels. He says: "I am inclined to think mesenteric aneurism is much more frequently responsible for the death of our patients than is generally supposed. Certainly, it is not the rare disease of old horses which the scant notices of our text-books might lead one to believe. It is a most common condition. Physiological experiments teach us that when the blood supply to the bowel is suddenly interrupted, violent intestinal movements result, and that, if the interruption be continued, a paralytic condition of bowel results. I would suggest that the first result is probably the precursor of twist, and the second is certainly the explanation of some cases of obstructed colon.

"How far mesenteric aneurism, thrombosis, and embolism are likely to give rise to the conditions referred to above, and to what extent they must be held responsible for the fatal termination of many of our bowel cases, is a matter which deserves more attention at the hands of the British veterinarian than it has hitherto received."

Dr. Willis cites seven post-mortems; five eight years old and under; two more aged. He found six with aneurisms, one of them with strongyles; the other one revealed a perfectly round hole, about the size of a sixpence, in the side of the ileum, near the ileo-cæcal valve. I am of the opinion, had his examinations been made with a little more care, he would have found the worm in each case; although, not necessarily at the point of aneurism.

J. E. Miller, M.R.C.V.S., in *Veterinary Record*, June 18, 1892, cites an exceptional case of mesenteric tumor with aneurism of anterior mesenteric artery.

Cobbold says: "So practically important, however, do I deem Bollinger's summary of the whole subject in relation to the hypopathological aspects of parasitism that I feel it desirable to record his conclusions at full length. No professional man having any pretensions to a knowledge of the veterinary art—or, for that matter,

to parasitism in relation to sanitation—should remain uninformed on this subject.” Dr. Bollinger’s results are thus stated :

1. The worm aneurism of the visceral arteries of the horse, existing in 90 to 94 per cent. of adult horses, has a general correspondence with the aneurisma verum mixtum of man. It is, however, distinguishable from the same by its seat, cause, character of its walls, contents, and mode of termination. The worm aneurism arises from a parasitism of the palisade worm (*strongylus armatus*), owing to an inflammatory affection of the arterial walls which it causes, and which one may describe as a recurrent traumatic endo arteritis. This holds good for all the visceral arteries, with the exception of the abdominal aorta, in which an aneurism may arise from local increase of pressure.

2. The formation and further development of the aneurism is also favored by the narrowing of the arterial calibre, which is caused by the inflammatory swelling of its walls, and also by the contemporaneous formation of a thrombus (clot), this latter still further supporting and exciting the inflammation of the inner coat.

3. Whilst the causes above mentioned (and of these more particularly the continued presence of the palisade worms and the plugging of the smaller arteries by thrombi) favor the growth of the worm-aneurism, the small size of the same, notwithstanding the years it has existed, is explained by the considerable hypertrophy of the muscular layer, by the tough fibrous capsule formed in many cases, by the connective tissue of the mesentery, and by the adhesion of the intestines to the perpendicular and free-lying anterior mesenteric artery. In particular this last-named circumstance does not allow of any very considerable shortening of the mesenteric artery, which would necessarily be accompanied by considerable dilatation of the arterial tube.

4. The favorite seat of the worm-aneurism is the trunk of the anterior mesenteric artery, directly at its origin from the abdominal aorta. Most frequently that part of the arterial trunk is dilated from which the arteria ilea, cæcales, and colica inferior (arteria ileo-cæco-colica) arise, less frequently the arteria colica superior at its origin, and the arteries of the cæcum and colon in their course in the meso-cæcum and meso-colon. The verminous aneurism also occurs in the coeliac artery (Bauchschlagader), in the posterior mesenteric artery (Gekros-arterie), in the renal artery, and in the abdominal aorta. A horse is not infrequently affected with several aneurisms of this kind at one and the same time. Thus, in one case (described by Bollinger) there were six of these aneurisms affecting the abdominal aorta and its branches in the same horse. The verminous

aneurism may occur from the sixth month of life onward, and with increasing age; the number of horses free from such aneurisms becomes continually smaller.

5. The size of the aneurism varies between that of a pea and that of a man's head. The dilatation is, as a rule, equal on all sides, the form being usually thumb-shaped or bottle-shaped, passing into that of a cone or long oval figure. This general configuration is principally due to the free and movable situation of the anterior mesenteric artery.

6. In contrast to aneurisms in man, the walls of the worm-aneurism of the horse are almost without exception indurated. In addition to the mesenteric connective tissue, all the arterial coats, and especially the tunica media, generally take part in this induration. The hypertrophy of the media, which stands unique in respect to what is known of arterial disease, forms a compensatory action of the arterial wall, analogous to the muscular hypertrophy of the heart in valvular disease. This change in the media points to the fact that in the development of aneurism in man the early disturbance of the nutritive process in the tunica media is not a less essential factor than the degeneration of the tunica intima.

The changes in the intima are the least constant. They present all stages of progressive and retrogressive metamorphosis, from simple induration to ulceration and calcification. In the walls of the verminous aneurism one not infrequently finds all the pathological changes exhibited by atheroma in man. Calcification is a common form of the retrograde process, and in very rare cases may pass on to the formation of true bone.

7. In addition to the palisade worms, one almost constantly finds a parietal thrombus contained in the aneurism. It covers the inner wall, either partially or completely, being in the latter case perforated by arterial offshoots. This clot may occlude the artery, and it is not infrequently continued into the arterial branches (peripherally) or into the aorta (centrally). Amongst the various changes that the clot undergoes, organization of its outermost layer and softening are the most frequent. The constant occurrence of this clot is due to the presence of the worms, to the inflammation, ulcerative and retrogressive affection of the intima, and to the dilatation of the arterial tube.

8. The palisade worms are seldom absent from aneurisms of the horse. Their not being present is merely an accidental circumstance. On the average, nine palisade worms go to a verminous aneurism,

and eleven in the horse. The highest number of worms found in one horse reached one hundred and twenty-one. Not infrequently, also, palisade worms, or their coverings in the form of larval skins, are found in the aneurismal walls. The immigration and emigration of the palisade worms out of the intestine into the aneurism, and the reverse, take place probably, as a rule, within the arterial circulation. The path of the worms does not appear to be always the same, inasmuch as they can also wander through the peritoneal cavity. The worms found in the aneurismal walls are probably mostly only strayed specimens.

9. From a comparative pathologico-anatomical point of view, the developmental history of the aneurisma verminosum proves that a circumscribed endo-arteritis can determine the formation of an aneurism.

10. Like the worm-aneurism itself, atheroma of the abdominal arteries arises from a circumscribed acute and subacute endo-arteritis. The histological changes in the secondary atheroma of horses are perfectly analogous to those of the spontaneous atheroma of man. Idiopathic atheroma as seen in man does not occur any more in the horse than in the other domestic animals. Atheroma in the horse is always secondary. To be sure, one observes an idiopathic chronic endo-arteritis in many abdominal arteries of the horse, which, however, never exhibits indications of atheromatous degeneration.

11. In consequence of its position the worm-aneurism of horses is not open to physical examination, and on that account cannot be diagnosed by physical signs; moreover, it offers no characteristic symptoms. Its termination by rupture is extremely rare, the aneurisms of the abdominal aorta being more disposed to rupture than those of the anterior mesenteric artery. Of eighteen cases of known perforation, fifteen opened into the peritoneal cavity and three into the bowel. The dangerous symptoms of the worm-aneurism are exclusively due to embolism and thrombosis of the affected artery, arising from the parietal clot. The latter becomes especially dangerous through its increasing size and the softening which often accompanies it. The absorption and shrinking of this parietal clot, be it organized or not, is materially assisted by the high pressure to which it is exposed.

12. The very marked symptoms of vascular obstruction—the sero-hemorrhagic intestinal infarct—in embolism and thrombosis of the mesenteric arteries are easily explained by paralysis of the muscular coat of the intestine, by the absence or paucity of valves in the portal

vein, by the readiness with which meteorismus (or flatus) arises, especially in herbivora, and by the loose consistence of the intestinal walls or villi.

13. The occlusion of the intestinal arteries, especially that arising suddenly, always has for its result a partial or complete paralysis of the portion of bowel which they supply. The palsy of the intestine causes the forward movement of the intestinal contents to cease, a stoppage of the feces, a hindrance to the discharge of feces and gas, and also that exceedingly dangerous formation of gas (within the intestinal tract) which in the herbivora is so abnormal, both quantitatively and qualitatively.

14. In embolism and thrombosis of the mesenteric arteries the symptoms during life are entirely identical with those observed in the so-called colic of horses, as has been determined by numerous observations. The partial paralysis of the bowel, which is brought on by the embolism and thrombosis of the mesenteric arteries, forms in great part the chief and leading feature of the series of symptoms known as the "colic" of horses. The palsy of the bowel which arises in this way may explain also the frequent ruptures of the digestive canal and the greater number of its changes in position. The latter are specially favored by the structure of the abdominal viscera in the horse.

15. The old changes which one finds in the peripheral branches of the anterior mesenteric artery in the form of expired and partly absorbed embolic and thrombotic processes (pigmentation, arterial and venous thrombi), particularly in connection with those arteries which are seats of the aneurism, decisively prove that the large majority of colics resulting in recovery, so far as they do not depend upon known injuries, are caused by paralysis of the bowel from embolism and thrombosis. The sudden occurrence, course, and result of these kinds of colics also testify to their embolic origin.

16. The oedematous, inflammatory, and hemorrhagic processes that one often finds described as the cause of death in colic almost exclusively depend upon thrombosis and embolism of the mesenteric arteries, the cases forming about 40 to 50 per cent. of all fatal colics.

17. The rapid course in fatal colics, as well as the preponderating symptoms of dyspnoea in cases of recovery, is finally due to the abnormal development of gas in the alimentary canal. In addition to the diminution of the respiratory surface by the lofty position of the diaphragm, a direct gas-poisoning (carbonic acid and sulphuretted hydrogen) probably contributes to the intensity of the symptoms and

the rapid course by diffusion of the abnormally developed gas out of the intestinal canal into the blood.

18. The variety of the anatomical derangements caused by embolism and thrombosis of the intestinal arteries is faithfully mirrored by the variety of the clinical symptoms and the different degrees in the intensity and course of the colic.

19. Amongst every 100 horses afflicted with internal disease, 40 are ill with colic. Among any 100 deceased horses 40 have perished from colic, and among 100 colic patients 87 recover and 13 die. The figures prove that neither amongst the epizootic nor sporadic diseases of horses is there any other affection which occurs so frequently or claims anything like so many victims. Like the frequency of the worm-aneurism, the amount of disease and mortality increases with advancing age. The etiology of the colic of horses finds in the thrombosis and embolism of the mesenteric arteries, with the consequent paralysis of the bowel, an all-sufficient explanation, whilst the causes of colic hitherto accepted were, for the most part, insufficient.

20. In a great number of cases the thrombus of the worm-aneurism is continued past the mouth of the anterior mesenteric artery into the lumen of the aorta, and, as such, is the exclusive cause of the embolisms of the pelvic and crural arteries which bring about the intermittent hobblings (the author says "intermitterendon Hinken," not "Hahnenritzen, the usual equivalent term for stringhalt). Considering the excessive frequency of the thrombus being continued into the aorta, it becomes highly probable that a great part of the diseases and lameness of the posterior extremities ("Huft und Kreuzlahme, unsichtbarer Spath, etc.," which may be rendered "sciatic and hip or spinal lameness, obscure spavin, etc.") are due to occlusion of the arteries.

21. Owing to the fibrous thickening of the connective tissue of the root of the anterior mesenteric round the aneurism, and to the considerable size of the latter, disturbances of the innervation of the intestine (as well as hindrances to the passage of the chyle, and irregularities in the portal circulation) may be created, which may well lie at the root of many chronic disturbances of digestion in horses.

22. Considering the great losses and heavy social disadvantages that are occasioned by the colic of horses to the horse-breeder, to agriculture, and to the general welfare, it is of the highest importance to discover means which should prevent the introduction of the

embryos with the food, and, as a consequence, the migration of the palisade worms into the mesenteric arteries of the horse.

In calling your attention to this subject, old as it is, I hope I have not encroached too much on your valuable time.

If I have been able to cause one of you to ask yourself, Can these statements made be sustained by post-mortem examination? for I think we have been able to, then, with the interest of your profession at heart, I hope you will open the Book of Nature and determine the fact for yourselves.

EXPLANATION OF PLATES.

PLATE I.

- Fig. 1. Male; *a*, caudal pouch; *b*, spicula.
 Fig. 2. Female; *a*, vulva; *b*, anus.
 Fig. 3. *a*, capsule; *b*, longitudinal line or rib; *c*, anterior teeth; *d*, anterior cilia; *e*, papillæ; *f*, posterior papillary bodies or plates; *g*, anterior armed pharyngeal ring; *h*, pharyngeal capsule; *k*, anterior constricted portion of œsophagus; *l*, posterior ventricle or bulb.
 Fig. 4. *c*, anterior teeth; *d*, anterior cilia.
 Fig. 5. *b*, longitudinal line or rib; *f*, posterior plates.
 Fig. 6. Anterior cilia.
 Fig. 7. Anterior papilla.
 Fig. 8. Fine anterior teeth.
 Fig. 9. Caudal pouch of male; *b*, spicula.
 Fig. 10. Posterior moiety of female; *b*, anus.
 Fig. 11. Undeveloped or agamous worm, in thin transparent membrane, which is shed on reaching maturity.
 Fig. 12. Ovum.

(These drawings are original, and made by Dr. J. M. Parker.)

PLATE II.

- Fig. 1. Caudal extremity of the male *Sclerostoma equinum* (Neumann.)
 Fig. 2. Fragments of the cæcum of a horse showing the tumors of different sizes due to the sclerostomes, as well as parasites fixed on the mucous membranes (Neumann.)

PLATE III.

- Fig. 1. Verminous aneurism of the great mesenteric artery; one-half natural size (Railliet.)
 Fig. 2. Abdominal aorta of a horse with its ramifications (Neumann.)

PLATE I

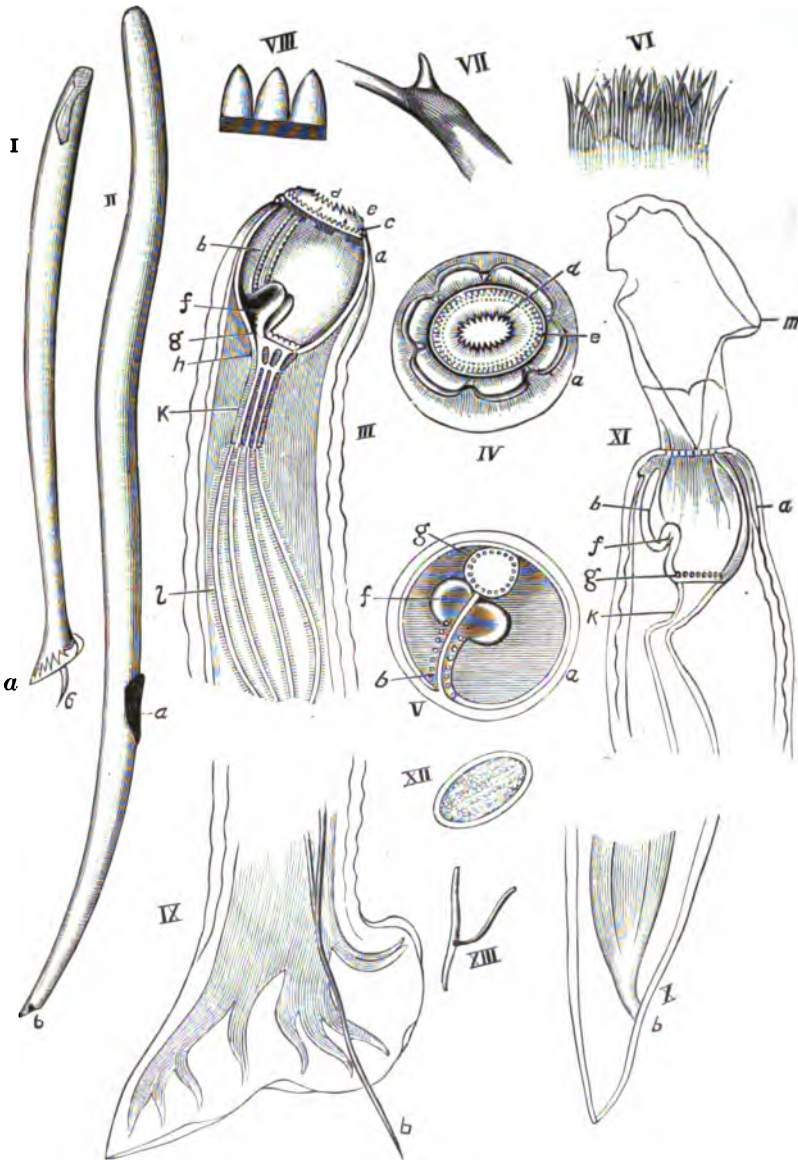


PLATE II.

FIG. 1.

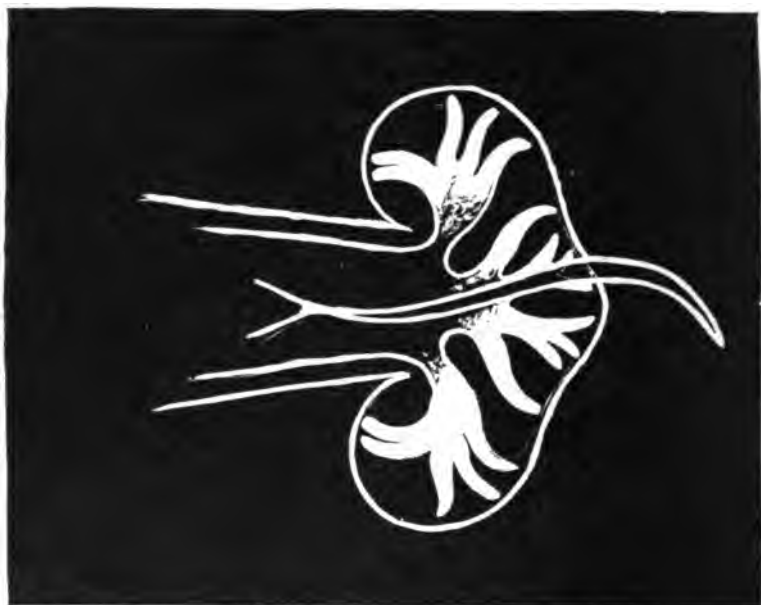


FIG. 2.

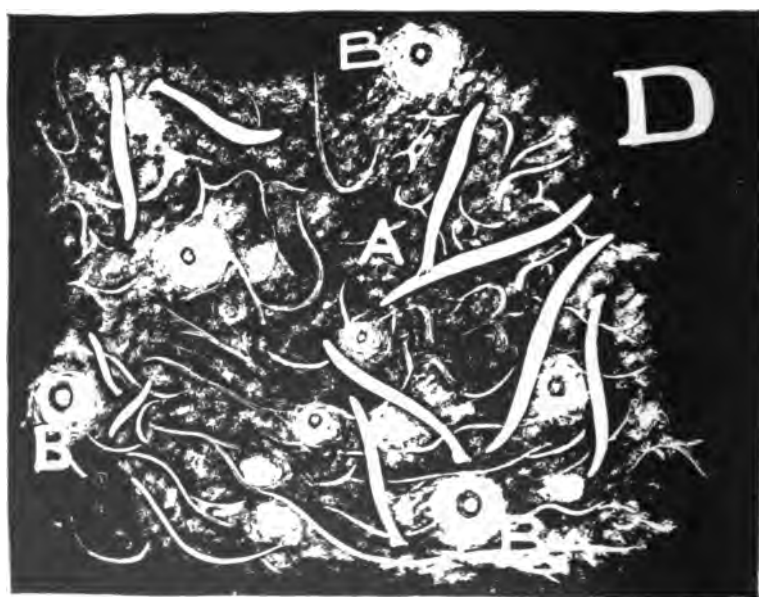


PLATE III.

Fig 1

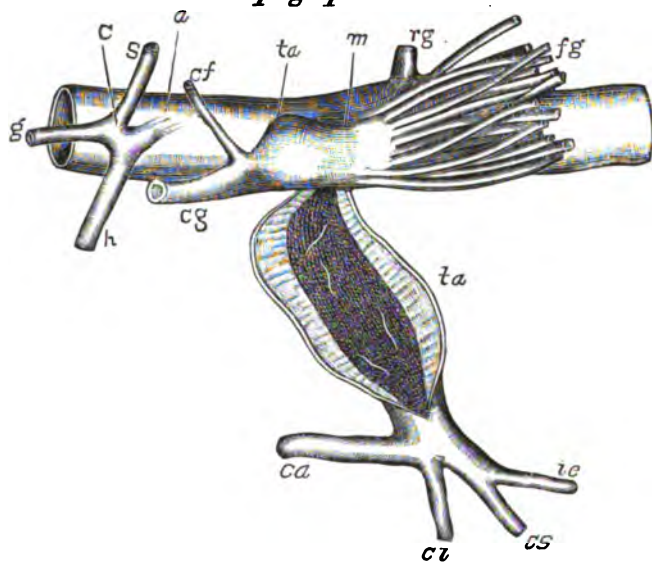
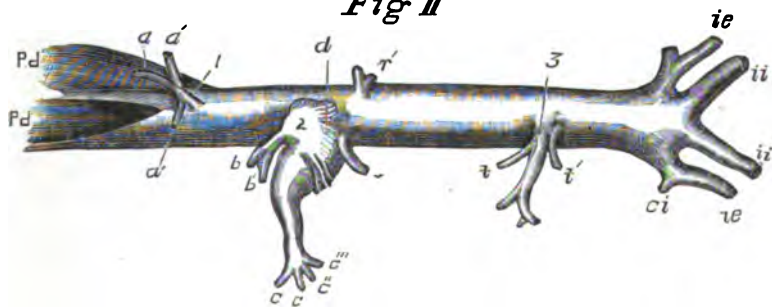


Fig II



DISCUSSION.

DR. WILKINSON: If my memory serves me Professor Dick lectured on that subject in 1857-8-9 in Middleboro, and Professor John Gamgee; also Dr. Locke, of Shrewsbury, in the eastern part of Great Britain, wrote upon it in the veterinary journals; Dr. Cobbold and, I think, Professor Duncan, of Ontario, also wrote on the same subject.

DR. CURTICE: I may say that I consider this one of the best papers I have ever heard on this subject. I think, from the veterinarian's standpoint, the Doctor did the best of anybody. He might have gone a little more into anatomy. He explained a question in biology which is most discussed and very interesting—the question of parasites, a sort of double migration. They must go to one place and then another before they arrive in their normal habitat. He told us that the little parasites when very young perforate the intestine, and then make a mucous cyst, and others make their way into bloodvessels and produce an aneurism. They then turn around and go back to pass their adult stage in the intestines. I have hunted in several of the cysts, not as many as the Doctor has examined, but quite carefully, to see if I could find one adult specimen in those cysts, not that I could not find all the apparatus of the adult except the sexual organs in the skin of the former state; that is, they have not moulted into the adult stage. I could find no remains of the young forms, and it will be of great interest to me to learn that the adults themselves can live in the cyst, and that they do migrate back into the intestine. One point he makes is, that it causes other diseases which we cannot exactly define, but the Doctor himself did not claim that it was the cause of colic, but he found it associated with colic as the probable cause of many cases. When you examine into these aneurisms and find the size of them you conclude that it must have taken a long time to get to that stage, a week or two weeks, I cannot tell how long. The colic should have preceded slightly before they attain to that stage, not suddenly, and that would seem to be against their causing all the colic. The first experience I had was in regard to the outbreak in Illinois, and that seemed to be entirely, judging from his description, from the armatus, but that was the regular outbreak in 1884-86-87. Of course, the Doctor could not tell the remedy for the parasite; that part he left for future investigation; but, on the whole, I believe that no helminthologist described the anatomy.

DR. LYFORD: I recall one remarkable instance where I was called to hold an autopsy on a horse which had been insured against fire, with the lightning clause in the policy. There had been a thunder-storm in the night, and the horse was fed and a noise was heard in the stable. The

owner came out and found the horse bleeding at the nose, and he died. Next day it was reported to the insurance man that the lightning had killed the horse, but the insurance company did not see how the horse lived from the evening before until nine o'clock the next day if the lightning had caused his death. They refused to pay for him, but they asked me to go and examine the horse and make an autopsy if necessary. I looked the stable over and found in it fresh blood which must have come from the nose or fauces or the opening of his guttural pouch. I opened the neck and found an aneurism. The result was that it put an end to the lightning trouble. I found that the trouble was caused by one of these small worms. Prior to that I had two cases of obstruction of the posterior aorta. In these two cases the treatment had been for congestion of the kidneys or different forms of the same disorder, and all the different diseases that they could think of that they would simulate. One man had treated one of these cases three times for these troubles, and, of course, it got well, as he supposed; but every time they exercised the horse he would lose control of his hind legs, and he would get the same treatment over again. Each time the doctor claimed to have cured him. One student of mine saw the horse. I asked him if the limbs were cold, and he said no. I put my hand in the rectum and then used a worm mixture, and the horse passed worms five inches long. Both of the iliac vessels were affected. The horse showed signs of colic. In three other cases the horse would go on and exercise and then fall over. The circulation would be sufficient standing or walking, but if they started to run they would commence to cramp again. All these three cases were caused by "strongylus." There are many cases of this disorder. I have found one or two cases where the horse died with indications of colic with "strongylus" in the mesentery artery.

DR. SALMON: I regret very much that I do not know enough about this subject to point out the remedy for the disorder treated in Dr. Winchester's paper. But I do know that it is a subject for congratulation that the men of this Association have begun to turn their attention to such an interesting question. This question of the animal parasites of our domestic animals is certainly one of the most interesting questions, and it is a field that has been worked less than almost any other field that we could take up. I realize this, possibly, from my own poor knowledge in this line. The many points and problems suggested here must emphasize the fact that this is a field in which investigators may work with the greatest hope of success. I must express my gratification that our members are turning their attention to this important line of investigation, and I hope with all my heart that it will be continued and that we shall have at our subsequent meetings papers of this character with regard to the animal parasites.

THE PRESIDENT : I have continued this study rather from the clinical standpoint than any other direction since contributing the article which I did several years ago to the *Veterinary Journal*. Dr. Winchester's paper was in line with my own thoughts with very few exceptions. I have heard of cases where the worms were countless. I did not undertake to enumerate them at all, as they were very numerous. There were several hundred certainly in one case.

Another point was the possibility of a positive diagnosis in this case. In the great number of cases which I have attended and which have died clearly from this disease, I have diagnosed but one positively. And yet in that one case I think I have shown that it can be diagnosed positively in a very large number of cases by rectal examination. It requires but very little experience to diagnose a disease, in such cases as I saw, with absolute accuracy. There are, of course, several obstacles in the way of such cases. First, the animal may be too young, so that this method is not open, as the anus and rectum are too small for this kind of examination. A second obstacle, especially in the region where I practise is the excessive size of the animal, in which you cannot reach the posterior mesenteric artery. It applied equally to the iliac and posterior aorta. A third obstacle to positive diagnosis in this way in these old chronic cases in which we have colics, the aneurism is comparatively small; but wherever you have a comparatively large-sized rectum, and the size of the animal will permit of reaching the mesenteric artery by the hand, there is no trouble in diagnosing the disease if we will take the trouble to examine it. The very large tumors are readily diagnosed. In one case it was ten or twelve inches in diameter. The location in the passage could be defined. This disease appears to cause death in a great variety of ways. In the first place, we have the growth of the animal interfered with very markedly by the gradual impediment offered to the circulation in the intestines, and this I may illustrate by a recent case in my own practice, in which a two-year old filly ceased to grow after one year old, although remaining in fair condition. At two years old she died from an aneurism, cordate in shape and about eight inches in diameter at the base, and some ten inches long, which had a very firm, thoroughly organized clot within, laminated; the walls of the artery about one inch in thickness, very dense, and firm.

In this case the first symptom of the disease was a great elevation of the temperature with profound general depression. The animal hung its head, the ears and lips drooped, the mucous membrane was discolored, breathed rapidly, and the temperature rose to 106°F. The animal did not lie down to any great extent, and when it did get down it lay quietly for perhaps half an hour or more. It did not roll during the entire course of the disease, and showed no evidence of abdominal pain. Here I felt that the cause of death, although I did not succeed in making a

post-mortem examination personally, was the interruption to such an extent that digestion was stopped, and we had as the result the absorption of an amount of poisonous products from the intestines, either products of digestion or the fermentation of food, which destroyed the animal's life. There was nothing, so far as I could learn from the man who conducted the post-mortem, which would otherwise account for the death.

In another case the intestines, large and small, were closely adhered over the tumor and there was a great amount of inflammation. In this case there was a great interference with digestion and colic, and, finally, the animal died from hemorrhage owing to rupture. In other cases we had embolism.

VETERINARY SCIENCE IN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

BY W. L. WILLIAMS, V.S.

IN studying the origin, development, history, resources, and future prospects of the veterinary profession in the United States, we should critically examine not alone the pioneer practitioners and the veterinary schools, but also every department of veterinary science which can in any appreciable manner affect its status as a whole.

The teaching of veterinary science in agricultural colleges dates from a very early period in our professional history, the pioneer institutions in this matter being, so far as I can learn, Cornell University, University of Illinois, and Amherst. Prof. Law was employed to come from England in 1868 to assume the chair of veterinary science at Cornell, which he continues to honorably fill, and at about the same time Dr. Detmers, now of Ohio University became lecturer on veterinary science in the University of Illinois, followed a few years later by Dr. F. H. Prentice, and about 1869 it appears that Dr. Stickney became lecturer on veterinary science at Amherst.

It is well known that these agricultural colleges with lecture- or professor-ships of veterinary science were largely the result of the Act of Congress of 1862, donating public lands to such States and Territories as would provide colleges for the teaching of agriculture and the mechanic arts.

These were given a still greater impetus in 1887 by the Act of Congress establishing agricultural experiment stations in connection with agricultural colleges, for original research into "the physiology of plants and animals, the diseases to which they are severally subject, with the remedies for the same," etc.

As a result of these inducements we find that at present twenty-two agricultural schools have lectures regularly delivered on veterinary science, to students of agriculture, while two colleges conduct regularly organized veterinary departments with a total of six veterinarians, making in all twenty-eight veterinarians regularly engaged in teaching veterinary science in colleges or universities owing their

origin and maintenance largely to the Federal legislation above cited. Of these twenty-eight veterinarians seventeen are also employed as veterinarians to experiment stations, and to these are to be added seven station veterinarians who maintain no relation to the teaching force of the colleges, constituting a total of thirty-five persons employed in these institutions either in teaching veterinary science or investigating animal diseases. Compared with the total number of veterinarians it is true their numbers are small, but when it is remembered that the parties in control of such institutions are presumed to seek out from among the masses those veterinarians showing the highest proficiency and greatest earnestness and progressiveness, and further that in such institutions the incumbents in the various positions are supposed to be provided with unusual facilities for study and research, and that such study is to be pursued and the results recorded as a part of their duty to the college, then this band of thirty-five veterinarians should be looked upon as at least a possible force in our professional development.

For the first few years of the period which our subject covers the duties of these veterinarians were confined nominally to the teaching of veterinary science to students in agriculture in such a manner and to such an extent as to be of practical value to them in rearing and handling live stock. Later, veterinary departments, leading to veterinary degrees, were established in several colleges, and still more recently the position of veterinarian to experiment stations.

The scope of our paper as announced is already too great, and we shall be obliged to leave out of consideration the veterinary departments in agricultural colleges and shall barely remark in passing that of four of these colleges which have been organized and solicited public patronage, Cornell University and the University of Minnesota have discontinued them, leaving the University of Ohio and the Iowa Agricultural College as the sole representatives of this class of instruction.

At the outset when, in 1868 and the immediately succeeding years, the pioneer teachers of veterinary science in agricultural schools were beginning their labors, the veterinary profession was practically unknown except in a few limited areas, including the great cities of the Atlantic seaboard, while medical care of the far greater part of our vast number of domestic animals was intrusted to a horde of untutored farriers and dissipated, unprincipled charlatans. Indeed, at that time, the name veterinary surgeon was unknown to the great mass of people, while that of "horse-doctor" was one of opprobrium

and disgrace, and the two terms were so frequently transposed as to occasionally cause annoyance to pioneer veterinarians. In some of our Western States the first qualified veterinarians to locate there were those employed by agricultural colleges, and in some cases, doubtless, no other practicable means would have induced the veterinarian to so locate.

The colleges could ill afford to employ other than men of high moral, social and educational standing, and in turn their relation to the college admitted the veterinarian without further credentials to agreeable social and professional associations, essential no more to his comfort than to his great usefulness in influencing the forces then busily laying the primitive foundation of our profession in the United States.

By his position as professor or lecturer, the veterinarian's services were frequently in demand by the leading owners of live-stock as well as by the local and general authorities in case of notable outbreaks of epizootic diseases, and, enjoying through his position public confidence and esteem, became unconsciously a teacher of no small import in a manner not expressly demanded as a part of his direct duties.

His services in this manner served without, in any degree, inconveniencing him, to pave the way for the great number of veterinarians so soon to become his neighbors and colleagues.

Yet his principal influence was to be exerted within college walls upon the agricultural students with whom he came in contact as instructor.

Primarily this influence was apparently intended to be confined to teaching the intended agriculturist those principles of anatomy, physiology, hygiene, pathology and therapeutics as would be directly applicable upon the stock farm. This purpose had a more valuable and direct application in the early history of the movement than obtains now, when graduated veterinarians are located in almost every considerable live-stock centre, a certain portion of whom are competent, qualified men.

True education is not readily hidden under a bushel, however, and when the student emerged from college with a true conception of veterinary science, although unacquainted with its details, he yet unconsciously became a force in his community, and bore to his neighbors some of the respect and admiration for veterinary science which he had obtained through his associations and study with his learned instructor.

This indirect influence, through the medium of students, added to the direct influence of the veterinarian by his contact with intelligent stockmen, exerted a powerful influence in the formation of our profession.

It was impracticable to obtain figures as to the exact number of students who came under the direct influence of these earlier teachers, but it would probably be safe to estimate their number in 1870 at no less than one hundred different students each year, which has slowly increased until the twenty-seven professors of veterinary science in these schools come in contact with not far from six hundred new students annually. These students, going out into their respective communities, imbued with a true conception of veterinary science, have exerted and continue to exert a good influence, second only to that of genuine veterinarians from our best veterinary schools.

They had much in their favor. The agricultural colleges, being jointly Federal and State institutions, were founded upon a high plane and were independent to a great extent from the greed exhibited by private institutions conducted for revenue, and demanded for admission to their classes a high order of moral and educational attainments from their very origin, which are, as yet, undreamed of in many of our veterinary schools of the present day. The veterinarians therefore came in contact not with ignorant, dissipated, ungentlemanly boors, but with high-minded gentlemen destined to occupy an honorable rank and exert a profound influence. It was these instructors of veterinary science more than any other one agency which made the phenomenal moral and educational progress of our profession within the past few years possible. I have heard this form of education bitterly denounced by graduates of cheap veterinary colleges who were sadly wanting in those qualities which go to constitute a gentleman; who lacked sufficient education to enter the preparatory classes in such institutions, and who had utterly failed in their brief college career to gain any conception of veterinary science, but only learned a few empirical formulæ which might enable them to eke out a fraudulent existence. These agricultural colleges have, in many States, proven the chief element in making veterinary science respectable, and have rendered it possible for fraudulent veterinarians to exist for a time in quasi-respectability. We do not hear such bitter denunciation from broadly educated, gentlemanly veterinarians.

There are, however, among the better educated of our profession, many persons who greatly under value the importance of these schools. It is, moreover, unfortunately true that both in the past and

at present there have been instructors in these schools who have failed in their mission and sent out students with superficial ideas relating exclusively to the "rule-of-thumb" practice, differing from charlatanism in none of its essential value, and having, to a certain extent, the same immoral or dishonest tendencies. Some, I believe, have held short courses of a few weeks' duration in veterinary science, and issued thereon certificates of a character which might prove of use in the hands of designing individuals in deceiving the public. But the failure of a few instructors to properly perform their duties—either through ignorance or design—does not constitute a proper basis for criticism of the entire body or the central idea of their work.

Again, especially in these short courses in which veterinary science forms a conspicuous part, there may occasionally enter designing individuals who come for the sole purpose of returning to their communities with some cheap notoriety, and use their attendance at the short course for advertising purposes. The cheapness, shortness of course, and absence of mental or moral faculties demanded at some of our veterinary schools, serves, however, to practically eliminate the danger in this direction from our agricultural schools.

On the other hand, many intelligent young men, reared on the farm and quite familiar in a general way with domestic animals, entered these schools, largely for the purpose of acquiring an amount of veterinary science which would prove useful to them as stock-breeders, especially in localities where veterinarians were then unavailable, became unexpectedly—at times almost unconsciously—swerved from their original purpose, and became special students of veterinary science, and along with such collateral studies as zoology, botany, chemistry, etc., took up, to a greater or less extent, the entire category of veterinary topics, and in their four years' course put as much time—frequently far more thought—upon these special branches than is allotted to students in our short-course colleges. Rarely did they stop with this, but having acquired a taste for veterinary study and an inspiration for earnest work, armed with a knowledge of the collateral studies until recently superior to that offered in any veterinary college in the land, and supported by a liberal general education, these students sought out veterinary colleges, and after obtaining liberal credits for the work done, entered the advanced classes and passed final examinations with credit. By referring to veterinary colleges requiring two or three terms' attendance for graduation, we find students from the agricultural schools admitted to examination after one session's attendance, and we have been

unable to find the record of one whose knowledge was found wanting, but in every, or nearly every case, they have carried off honors, and in an unusually large per cent. of cases have won first place. They were not book worms either, but sustain to-day in the battle of life the positions assumed upon graduation. Numbering far less than ten per cent. of the total number of graduates from American colleges, a very large proportion of these students from agricultural colleges, or from veterinary departments of agricultural colleges, occupy prominent positions.

Of the thirty-seven veterinarians engaged in experiment stations or teaching in agricultural colleges, twenty-four received their veterinary education in America, and of these no less than sixteen, or sixty-seven per cent., are either graduates of these colleges or had been well advanced in the courses prescribed therein.

If we turn to the pages of current veterinary literature or to our National Bureau of Animal Industry, or to the faculties of our veterinary colleges, we find the names of these once agricultural students occupying a prominent place, and here in our national association we find these same men prominent in our councils and discussions. Certainly, these men must wield a far-reaching and salutary influence not alone as moulders of public opinion, but to them certainly is due the decision of many young men of education and character to take up as a life work the study of veterinary science.

So far we have dealt with the work and influence of these colleges in the past, when the veterinarian occupied the single position of lecturer or professor of veterinary science. At present the number of veterinarians has increased very considerably, and a new element has appeared which is closely bound up with the work heretofore done; the agricultural experiment station has been added, and the professor of veterinary science has in nearly every case been asked to accept, in addition to his former work, the post of veterinarian to the experiment station, and his salary has been apportioned between the two. A few of them maintain the professorship alone, while in other cases there is no connection with the teaching department, but only with the station.

The scope of study has not materially changed in recent years, and still embraces, as a rule, a consideration of all the major subjects of veterinary science, varying greatly in different colleges in thoroughness and amount of time devoted to it.

In some veterinary science is taught in but one year of the course,

or even less, occupying five hours' class-room work per week, while in other schools each class in the four-year course comes in contact each year with the instructor in veterinary science, so that during their course they devote about five hundred hours of class-room and laboratory work to distinct veterinary topics—an amount of time almost equivalent to that required in some of our shorter-course veterinary colleges. Such is the amount of time required by some colleges, such as Purdue University, with iron-clad course of study, and all students taking the agricultural course must take so much veterinary science and no more. In other institutions, like Cornell University and the University of Illinois, which are largely elective, the student may take a much shorter course in veterinary science, or may, at his option, in many cases prolong it far beyond the point named, exceeding in the time allotted to it the time required for graduation in most of our veterinary colleges.

Thus, the writer devoted to the study of veterinary science, not including collateral studies, one-third time for three years of nine months, or the equivalent of full time of one year of nine months, equalling the time devoted in some of our veterinary colleges *including* collateral branches.

The equipment in these colleges varies greatly. In some it is practically wanting, while in others it surpasses in some respects that of many of the veterinary colleges. As a student I found a better equipment in library, instruments, and apparatus at the agricultural than at the veterinary school, and to-day several agricultural schools place at the disposal of their students better libraries than do the veterinary colleges; while their collection of instruments and apparatus quite suffices for purposes of instruction.

In point of buildings the equipment shows extreme variation. The class-rooms are usually located in some of the main buildings, and generally some detached buildings more or less commodious and convenient are provided for special phases of work. Practically all the colleges having maintained a chair of veterinary science for any length of time are provided with ample dissecting-rooms, where the anatomy of the domestic animals may be studied under very favorable conditions.

In most colleges ample accommodations are afforded for the conducting of free clinics, while in others they are limited, and still more frequently illy arranged and not adapted to their needs.

As an illustration, I might cite Purdue University, which, in one building 28 by 35 feet, expects dissections, experiments with conta-

gious diseases, and free clinics to be simultaneously and successfully conducted—three classes of work under one roof, and practically in the same room, which are universally recognized as incompatible.

The operating-room in this case adjoins directly the dissecting-room, with a door opening between, rendering it impossible to carry out the modern rules of surgery, and making any surgical operation highly dangerous. The private surgeon operating under such conditions would be held responsible for untoward results in his patients.

The additional possible danger of contagious diseases in contiguous stalls renders the conditions for free clinics quite unfavorable. This probably forms a solitary exception in such mal-arrangement of buildings, and there is reason to hope it will be eventually remedied. I know of no other school where such unfavorable conditions exist.

The material for clinical demonstration in most of these schools is reasonably adequate and of an appropriate character, since the schools are generally located in agricultural communities, and the clinics usually free; the agricultural student receives clinical instruction upon those diseases most prevalent among farm animals, and consequently of most direct interest and value to him.

Again, the student who desires later to complete an education in veterinary science finds these clinics of special value, pre-eminently so if he intends after graduation to locate in an agricultural region. In this respect these clinics are usually quite superior in character to those offered in our veterinary colleges located in large cities, where they are confined closely to the diseases incident to city environments and work, while the diseases of young and breeding animals are rarely met with. Here the intending veterinary student can study with great advantage the collateral branches and acquire a general education, which is, as a rule, sadly deficient in our profession in America—and can at the same time enter upon the more direct veterinary studies deliberately and yet earnestly, and in addition enjoy special facilities for studying that class of diseases which are the most ineffectually taught in veterinary colleges—the diseases of young and breeding animals.

It certainly should cause no surprise to find such students distinguishing themselves in the veterinary colleges after such deliberate preparations, instead of plunging suddenly into the whirl of the busy curriculum of the short-course college with neither general nor special preparation.

In additional proof of the value of this teaching it may be related that our leading veterinary schools are careful to obtain catalogues of

these agricultural colleges, and supply to each agricultural student their catalogues, knowing full well that from their ranks they secure their best and most reliable material. Yet there is no reason for doubting if we have made any substantial progress in these respects in later years.

Where the instructor in veterinary science maintains the same position held ten to twenty years ago, and is simply professor of veterinary science, there is certainly every reason to expect even greater good, and in a fair proportion of cases we believe these expectations are realized; but in the majority of these institutions the veterinary surgeon is made jointly professor of veterinary science in the college and veterinarian to the agricultural experiment station, drawing about one-half his salary from each and being expected to divide his time accordingly. In addition to filling these two positions some occupy also that of State veterinarian, and all or nearly all are permitted to use the residue of their time in private practice. If prior to the origin of the experiment station the veterinarian's time was profitably consumed in his duties, then it must be admitted that having him do the same work in one half the time must act injuriously on the results. It may properly be urged that in most cases the experimental work is slighted and the usual time given to college work proper, in which case it would be difficult to defend the practice of paying half the salary from the experiment station fund. As already indicated, veterinarians in experiment stations may be divided into two classes, those who are at the same time teachers in the agricultural classes and those whose whole time and duty are confined to experimental work. The salaries and expenses for material for both classes are paid from the experiment station appropriation provided for by Congress in the Act of 1887. The sixteen veterinarians who are jointly teachers and experimenters cost the Federal treasury not far from \$20,000 per annum on account of station fund, while the eight persons engaged exclusively in this work cost in salaries and material not far from \$30,000—or a total cost per annum for experiments on animals of \$50,000. A comparison of these figures with the existing equipments and the work accomplished, as shown by recorded results, is to say the least somewhat startling. There is more than one station where the veterinarian receives one-half his salary for supposed station work, yet has no building, or even a paddock, coop or cage in which to confine an experiment animal, has no animal to confine, no microscope or microscopical appliance, no bacteriological apparatus, no money to expend for material, appli-

ances or other necessities, and no immediate prospects of such funds or conveniences being placed at his command. Yet such men inform me that they are occasionally chided for their meagre results. Still they can scarcely be called the most unfortunately situated, and instead of saying "Blessed are the poor," we should say "Blessed are the destitute," for from them no rational man can expect returns. Surely some of us are in a far more unpleasant situation, with buildings totally inadequate and wholly unsuitable, enough apparatus to occupy some space, yet not enough to work with, and an amount of funds available barely sufficient to warrant failure of every undertaking.

At the scene of my labors the veterinarian has at his command one microscope without eye-pieces, and while there is a considerable number of appliances for bacteriological work, yet the equipment is quite inadequate.

For material the necessary funds cannot be obtained. When eight or ten cattle were asked for and promised, as a basis for experimentation with *actinomyces bovis* in relation to its transmissibility from animal to animal, and the fitness of the meat of actinomycotic cattle for human food, the authorities delivered one superannuated he goat whose peculiar idiosyncrasies and odor had rendered him unpopular at the college farm. While the demands have not in all cases been wholly denied, yet the funds placed at the disposal of the veterinarian have been so meagre as to insure failure of experimental work and bring all the more censure on the veterinarian for the want of substantial results for the meagre expenditure. The equipment in other stations, where one man is expected to act as both professor of veterinary science and veterinarian to the experiment station, is in some cases not a little better than what we have related, though certainly wholly inadequate, with but two or three exceptions, to warrant the expectation of creditable results.

Another formidable obstacle to successful experimentation is the heavy demands of class work upon the time and thought of the veterinarian. Five hundred hours annually, or an average of three hours per day during the school year, devoted to class work, with the necessary time for due preparation for class duties, is in itself sufficient work for the average man. To this must be added time for private practice, which is essential to the capable teacher in order that he may teach from the practical standpoint of experience. Surely little should be expected of him in addition.

In general, also, experiment stations are under the direct manage-

ment of the station director and college president, who only in a moderate number of cases have any practical knowledge of live stock and very rarely anything approaching a just conception of veterinary science, but generally have educations leading to such degrees as M.A., LL.D., D.D., Ag.Ch., B.S., etc., rendering successful work under them improbable, except the veterinarian enjoy their confidence to such a degree (which is rarely the case) as to receive their sanction to do his work in his own way.

Yet another serious obstacle confronts the labor of this double-headed scientist. The ideal professor of veterinary science in an agricultural college must be a veterinarian who, along with a suitable general and special education, has a long and extensive experience in a rural practice, and has acquired an experimental knowledge of the diseases and their causes of farm animals, especially of young and breeding stock.

On the other hand, the veterinarian to the experiment station is expected to possess, and, as a rule, should have a thorough practical knowledge of bacteriology and bacteriological methods, which requires a long and close application to laboratory study.

If we have a man in this country who possesses both these requirements to a high degree he has so far concealed his identity. Such a combination is, in fact, practically impossible.

The literature supplied specially for the veterinarian is, as a rule, very meagre. In my own case, although the post of veterinarian has existed for four or five years, he is not supplied with any current literature relating to his work, and only during the past few weeks the first two standard books relating to his work were procured.

Under such unfavorable environments we are not warranted in expecting great results.

With the few stations commanding the entire time and energy of their veterinarian we find naturally better equipments for the work; Nebraska leading, followed by Missouri and others of less note.

We have given a rough estimate of the number of workers in experiment stations, their equipment and environment, and their cost to the country. Their value must be estimated by the work accomplished and recorded. During the past year we have received station bulletins to which veterinarians have contributed three popular articles on glanders, and one on diseases of sheep, none of which made any pretence to being scientific nor to have been founded on any original work or study of the authors, but merely short, popular descriptions for farmers; also one treatise on flukes; one on Texas

fever and hog cholera; one on ringworm in cattle, and one on enzootic cerebritis in horses, all of which were brief, and contained nothing in advance of the general level of veterinary science, and nothing likely to be preserved in future years as treasures of science; although it must be admitted in passing that some of them possessed temporary value to farmers and stockmen, and even in some cases to veterinarians.

One more recent contribution to our literature from station veterinarians must be passed in review, being an article entitled "A Double Monstrosity of a Calf, Traceable to an Injury of its Mother," occurring in a bulletin of the Minnesota station, in which the veterinarian describes a calf born at full term and normally developed, except a slight spinal curvature and absence of an anus and part of the intestine, and relates that the mother when five months pregnant was slightly horned by another cow high in the right flank sufficient to cause a bruise as large as a fifty-cent piece, and says, "No other conclusion could be reached than to ascribe the cause of the abnormalities of the calf to the blow which its mother received four months previous to the birth;" and concluded that this case furnished a powerful argument in favor of dehorning. How a slight wound, insufficient to abrade the mother's skin, and located in a part quite distant from the foetus *in utero*, could curve the spinal column of the foetus, annihilate a considerable portion and displace the remainder of its intestine without injuring the dam or the foetal membrane, or in any way interfering with the health and growth of the foetus itself, the author does not attempt to explain. In fact, he cannot explain, except by revolutionizing our present knowledge of embryology, and the contribution without reasonable explanation is certainly unwarranted, yet station directors demand and expect contributions of the character of these for the purpose of making a show in their bulletins, and thus attempt to have the public believe that the station veterinarian is actively engaged in important scientific work. I know that some of these bulletins were written under protest from their authors, but their protests were ignored.

The past year's record is a fair sample of preceding years with a few notable exceptions, and gives a reasonable estimate of the returns for the annual expenditure of \$50,000 in this work.

In earlier years Billings and Detmers have contributed considerable of interest to experiment station literature, confined chiefly to hog cholera, although they have added some minor contributions of distinct merit. All are to some extent acquainted with the hog

cholera contributions of Billings, which are so heavily adulterated with personal egotism for himself and personal hatred toward others as to render it difficult to sift out valuable truths, and it will probably be several years before a safe estimate can be placed on the value of his work. More recently his contributions are almost wholly personal in character, and should the present rate of convergence toward personality continue, hog cholera will be entirely crowded out, and his entire energy, capital, and force will be expended upon Billings and Salmon.

If the estimate which I have placed upon the results of experimental work in relation to animals and animal diseases as carried on in experiment stations is at all within the bounds of reason it must be admitted that there is a gross waste of public funds and that there is need of some abuses to be corrected.

The possible importance of these experiment stations to our profession is great, and we should look to it that these possibilities are in a reasonable measure realized. The proper equipment of a few stations for veterinary experimentation, with competent veterinarians in charge, should, and doubtless would, do much for the welfare of the nation and the honor of our profession. At present we lack two elements, equipment and men, but given the former, and let it be understood that there is a suitable field for the latter, they will not be long in being found.

While a given experiment on animals is far more expensive usually than other agricultural experimentation, yet they possess the great value of universal application, whereas an experiment on cereals, etc., applies only to the same climate, soil, season, and other environments, but the nature of one animal disease is the same in winter as in summer, in wet or dry seasons, in North or South, on clay soil or loam.

States having great live-stock interests could well afford to discontinue a large part of their experimentation with wheat, peanuts, and morning-glories, and devote a large part of the experimental fund to animal physiology and pathology in conformity with the letter and spirit of the law; but the less of the fund expended on men under the present environments of joint positions of professor and experimenter, the better both for the community and our profession.

Do one thing well, can be emphasized no more in any field of work than the one under consideration.

We believe it was an evil day when these two lines were attempted to be combined in one man.

In those colleges and stations where an equipment, although inadequate, is furnished, there is usually sufficient annoyance to the veterinarian to detract his attention from his class-room work (which would otherwise be far better accomplished), and results in his doing half time and thought at two lines of work and leaving each line half done. We have noted the insignificance of the investigations recorded by experimenters, and were we to turn to their recorded study and work as teachers when occupying the double position we should find it quite as meagre. It is a noteworthy fact that these colleges go to our veterinary colleges and select in the main the brightest and most promising young members of our profession, and under proper environments these men should distinguish themselves by their recorded observations and studies, for certainly their opportunities in these places should be the very best; yet it seems that a man no sooner enters such a position than he is largely lost to sight in so far as recorded work is concerned.

Few, indeed, among them are ever heard from in standard literature in our journals or in our associations.

It is to be hoped that these matters will soon largely mend themselves. First of all, the lack of results from station work must eventually force those in control to seek the cause and attempt its removal, and when that is done we believe we shall find the positions of teacher and experimenter thoroughly separated. A mutual friendship and interest between the two should always exist, as they must prove very helpful to each other in many ways.

The teacher should be left free to devote his energies to teaching, and allowed time for study and thought and opportunity for such an amount of private practice as would keep him refreshed and experienced. Experimental pathology belongs more properly to veterinary sanitary science, and should be pursued rather in relation with the veterinary police system of a State than with college education, and should to a great extent be under the control of intelligent stockmen.

College authorities should create some standard to be applied in securing or retaining veterinarians in their positions, and should demand, in addition to the requirements of common manhood and education, special adaptability for the position of teacher or experimenter, as evidenced by successful work already accomplished in the line of proposed future duties, and not rely wholly upon the recommendations of interested preceptors or promiscuous laudations of incompetent persons.

Then, when a man is selected for one of these positions, let his superiors give him ample equipment and reasonable freedom in the detail of his work, and then demand results and accept no apologies. We are constrained to believe that in the not far distant future these two lines of veterinary work will develop rapidly, resulting in great good to the Commonwealth and honors to our profession and to science in general.

DISCUSSION.

Dr. SCHWARTZKOPFF: I was very much interested in Dr. Williams's paper; I think that I should hold the same opinion with him on the general principles of this instruction in our agricultural colleges. I have had a personal experience with this education for the last four years, being employed as teacher of agricultural students. The first year when I attempted to give this instruction in the colleges I must confess that it was rather difficult for me to find the proper limits of what to say and of what not to say to such classes of students. You must take into account that the men who attend these colleges in the West are farmers' boys with only a common school education and with ideas of learning the rudiments of stock raising, etc. After experimenting in the instruction in veterinary science for some time, I limited the instruction to the rudiments and elements of physiology in the first term. In the second term to the rudiments of anatomy, therapeutics, and general hygiene.

Dr. FAVILLE: I wish simply, if possible, to enforce what Dr. Schwartzkopff has just said. We would scarcely consider that a pupil of our high schools was having the proper thing done by him unless the rudiments of physiology and hygiene were taught him. There is not an agricultural college in the United States that I know of which attempts to make practitioners of the listeners to its lecturers. I know from five years of my own experience in limiting myself that I consider the best thing to talk to these students upon is the hygiene of animals, the best sanitary conditions in which to keep them, etc. I believe I know from having had experience in localities where the students have come from to these schools, that they are the very best class of clients which we can get in our communities. They appreciate the fact that they do not know. The quacks that we have to contend with are persons who can scarcely read or write. They are men who have a few recipes for which they have paid from two to five dollars apiece. But the educated boys who come from agricultural colleges know enough of the business to know that they do not know anything. That is

exactly the point, and I believe that as members of this Association, representing the veterinary practitioners of this country, we can well afford to encourage the teaching of veterinary knowledge on the lines of Dr. Williams's paper and according to the remarks of Dr. Schwartzkopff.

Dr. CURTICE: I know of men who have attained the degree of Bachelor of Science in these colleges, men who have passed high examinations, and I do not know that the profession has had any cause to complain of a single one who has gone out of the university which I have in mind, as being a quack, or practising when he ought not to, or with insufficient knowledge.

OUR DUTY. TO THE CATTLE INTERESTS OF THE COUNTRY.

By JOHN W. GADSDEN, M.R.C.V.S.

It is as much the duty of the veterinarian to advise measures for the prevention of disease as to prescribe remedies for its cure.

The Department of Agriculture of the United States having declared officially that this country is entirely free from contagious pleuro-pneumonia, it behooves us to be continually on the alert to prevent its reintroduction. The struggle has been an arduous one; it has lasted for years, and the greatest credit is due to the officers of the department, especially those connected with the Bureau of Animal Industry, as well as the members and officials of the several State boards and commissions, for the untiring efforts and indefatigable energy they have manifested in ridding the country of this terrible scourge that has proven destructive alike to our food supply and the export trade in cattle. The campaign from the start has been one of education, as well as extermination, and in this the veterinarian has played a most important part.

His province it was not only to diagnose the symptoms of the disease and determine its existence in the animals suspected, but to convince the owners, and others interested, of its contagious character and the great danger to herds of cattle by the introduction of, or association with, an animal that was or had been infected with it.

This was a more difficult task than would be imagined. Those who have had practical or experimental knowledge of the disease were few, and the skeptics were many.

Even some of those who have since become active workers in the suppression of the plague were difficult to convince of its true character and the dangers to be apprehended from it.

Introduced in every case from foreign countries, never in a single instance originating in this, it found lodgment in different localities along the Eastern seaboard, gradually extending, from time to time, further inland, in spite of the spasmodic measures that were now and

again adopted for stamping it out, but it was not till it reached the great cattle centres of the West, and imminent danger threatened the immense herds upon the plains, as well as the cattle in store in the stock-yards and markets of the large cities, that public interest was fully awakened, and such appropriations were obtained from both National and State legislatures as enabled systematic measures to be taken to prevent the spread of the disease and lead to its extermination.

It may be of interest to trace the efforts made in this country during the last fifteen years to stamp out the disease, as far as possible determine their approximate cost, consider the losses our cattle owners have sustained by reason of the embargoes placed on the importation of American cattle in consequence of the disease existing here, and from these lessons of the past learn wisdom for the future.

You, gentlemen, who have a full knowledge of the insidious nature of the disease; who have battled so manfully to aid in stamping it out, can speak in no uncertain terms as to the danger we incur in permitting the importation of cattle from countries where the plague now exists; and when we consider how small the interest involved in the importation of cattle in proportion to the large amount invested in our native animals, it would seem that the request is most reasonable that the National Government should absolutely prohibit the importation of live cattle from any country in which the disease can at present be found.

In November, 1878, Commissioner Le Duc, of the Department of Agriculture, in his annual report, called attention to the existence of contagious pleuro-pneumonia in this country, and gave warning as to the danger to be apprehended from it. This report alarmed our neighbors across the water, who had already suffered considerably from the plague, and was read in the British House of Commons and ultimately led to the placing of the embargo on American cattle in the following year—1879.

In January of that year a commissioner from the Canadian Government visited a number of our Eastern cities and found the disease in several localities, while it was claimed at the same time that Canada was entirely free from contagion.

The consequence was the prohibition of live cattle shipped from ports of the United States being admitted into England unless they were slaughtered at the port of entry, while those from Canadian ports were freely admitted.

The State of Pennsylvania early in 1879 commenced the work

of stamping out contagious pleuro-pneumonia, and time and again, when entirely free from the disease, received infected animals from other places, causing fresh outbreaks, until the National Government stepped in, and the Department of Agriculture, co-operating with the State Board, effectually stamped out all existing disease, and prevented any further introduction from other States, and now the State Veterinarian informs me there has not been a case reported for two years.

The expense incurred by that State alone was \$36,582.90, of which \$12,750 was for cattle killed, and during the time the disease existed there were 159 herds, containing 3010 animals, in the quarantine.

In November, 1883, a convention was called in the city of Chicago by Hon. Geo. B. Loring, Commissioner of Agriculture, to consider the subject of contagious diseases of domestic animals. At that time, according to the statement of Dr. Salmon, "there had never been a case of contagious pleuro-pneumonia found west of the Allegheny Mountains, and east of them it was confined to a single farm in Connecticut, a half dozen farms in Pennsylvania, a dozen in New Jersey, and no evidence of the disease beyond the immediate vicinity of a few large cities, New York, Brooklyn, Newark, Baltimore, and possibly Washington, and it would be an exaggeration to say the loss exceeded \$100,000 a year."

Much valuable information was given at this convention, and the Western cattle owners were aroused to the importance of vigorous action to avert the danger which threatened them.

A committee was appointed to present a memorial to Congress, "setting forth the loss and damage they had sustained in business, not only by reason of the fact that contagious diseases do exist to a limited extent in this country, but also of the much greater loss and damage we sustain by reason of the embarrassing restriction, and in some cases prohibitory regulations which have been adopted by foreign governments against American live stock and dead meat products."

The committee was also to confer with the Secretary of the Treasury, Commissioner of Agriculture, and other officers and persons, and suggest to Congress such points of legislation as they deemed best calculated to protect our interests, and remove foreign prejudice against our meat products.

The committee went to Washington and appeared before the committees of Congress, and the Bureau of Animal Industry was created by Act of May 29, 1884. This was a big step in the right direction,

but things still drifted on in the old way, outbreaks occurring in the East, and our friends in the West hugging themselves in fancied security, while Canada monopolized the profitable portion of the cattle trade.

But a change came, a very sudden change, when in September, 1886, the first outbreak occurred in Chicago; then vigorous measures were adopted and the machinery of the Bureau was put into full operation to aid the determined efforts made by the Illinois Live Stock Commissioners and their able veterinarian to stamp out the disease. Between September 12, 1886, and December 28, 1887, 14,423 animals were slaughtered in Illinois; of these 2058 were affected with the disease, and the balance had been exposed to it.

The net cost paid by the State for slaughtered animals was \$35,398.78, and the additional expense of stamping out disease approximated \$25,000.

From statistics kindly furnished by the Bureau of Animal Industry for the first five years, from 1887 to 1891, inclusive, I find there were 147,672 herds, numbering 1,352,203 cattle inspected; 212,491 post-mortems made, of which 7543 animals were found diseased.

There were 6587 diseased cattle purchased at a cost of \$165,452.73, and 16,291 animals purchased that had been exposed to the disease at a cost of \$373,029.68. The other expenses incident to suppressing contagious pleuro-pneumonia were \$912,476.28, or a total expense in the five years of \$1,450,958.68—money well expended, and that has accomplished what is worth to our cattle owners a hundred times its value in getting the country entirely free of the plague, but which will have been simply wasted if we permit the disease to be again introduced, and our experience with it renewed.

But this is a very small percentage of the loss involved by the existence of disease in this country. During the seven years from 1886 to 1892, inclusive, we have shipped to England 1,617,560 animals, which all had to be slaughtered at the port of entry, causing, as I am informed by competent experts, a money loss of at least \$10 per head, or a total of \$16,175,600; in addition to this, during the same period we shipped dressed beef valued at \$81,737,866, which at the low estimate of one cent a pound additional value which it would have realized could it have been shipped alive, without immediate slaughter, would round up the total loss to the cattle interests of this country in the last seven years of \$25,000,000 in addition to what the National Government and several States have spent to get rid of the disease.

In the same period we have imported 2240 cattle.¹

Shall we take the risk of becoming again infected for this small number?

Great Britain still continues the embargo against the United States, whose officials charged with the duty of ascertaining, declare to be entirely free of disease, while the latest English veterinary journals announce two new outbreaks in that country.

Common justice would seem to demand, then, that we prohibit the importation of English cattle, for our own protection, until she can show a clean bill of health, and request that the restrictions be removed against American cattle, now that we have, by heroic measures and the outlay of a large sum of money, succeeded in eradicating the disease.

You, gentlemen, who have watched the progress of the disease in this country from its first introduction to its final stamping out, will fully appreciate the value of the ounce of prevention which would have saved the expenditure of the large amounts of money necessary for the pound of cure.

Had we adopted the same vigorous measures in 1878, when the disease was first brought officially to notice, and when it was confined to a limited area, as we did in 1886, when it had crossed the mountains and was extending its ravages to the West, it would have been a comparatively easy matter to eradicate it.

Let us take heed of our experience, and being now free of contagion, advocate the most radical measures to continue so; and as your influence will be felt throughout the length and breadth of this land, as those who by education and experience can speak advisedly of the dangers to be apprehended from the reintroduction of the disease in animals coming from infected countries, I most earnestly exhort you to lend the weight of your association and your personal influence to prevent the importation of any cattle from countries where contagious pleuro-pneumonia exists.

¹ Imported cattle for breeding purposes during the past six years; 1886, 1011; 1887, 626; 1888, 286; 1889, 166; 1890, 112; 1891, 39; total, 2240.

LOCAL TUBERCULOUS ABSCESS IN A BULL.

By WYATT JOHNSTON, M.D.,
MONTREAL.

THE importance which now attaches to the early recognition of tuberculosis in herds of valuable cattle makes it of interest to record the following unusual case :

On March 11, 1890, I received from Dr. D. McEachran, of Montreal, a specimen of pus, with the statement that it came from a small abscess about the jaw of a valuable thoroughbred bull, and the owner of the animal feared that it might be suffering from tuberculosis.

The history of the stock did not give any evidence of tuberculosis having occurred among the other animals, though it had appeared about two years before on an adjoining farm, and the present subject had served a cow in this herd during the previous season.

The present animal, a fine, strong, healthy looking bull, four years old, was always in perfect health till two months previous, when the attendant noticed a swelling beneath the jaw. This suppurated, and was opened, but did not heal up. Recently another small abscess formed in the neck, which also did not heal when opened. The attendant thought that the inflammation was caused by the chafing of a rope around the animal's neck in the stall.

The pus when received was grayish and oily looking, like freshly mixed paint, with faint streaks of red. It contained numerous small, bright yellow particles the size of pinheads, and some small gritty bodies of about the same size. Microscopically, it was composed of leucocytes, a few red blood-cells, and fat crystals. The yellow particles proved not to be actinomyces. Cover-glass preparations (ten in number) were examined without detecting tubercular bacilli. Some of the covers were left as long as eighteen hours in the stain. No other bacteria appeared to be present.

I inoculated three rabbits in the anterior chamber and three guinea-pigs in the peritoneal cavity, using one to two drops of pus in

each case. A guinea-pig and a rabbit were placed for control in the same cages with the inoculated animals.

On March 15th I visited the farm in company with the owner and Prof. McEachran. The bull was found to be a fine, healthy looking, well-nourished animal. Beneath the jaw were two small suppurating abscess cavities on the left side, with red, firm granulating walls. Lymph glands in the neck not enlarged. Physical examination showed no evidences whatever of tuberculosis.

In spite of Dr. McEachran's recommendation to delay a few weeks till we learned the result of the inoculation, keeping the bull meanwhile under observation and carefully isolating him, the owner insisted on his being slaughtered immediately, together with a yearling bull the get of the one under consideration. Accordingly, we had an opportunity of making an autopsy on both animals forthwith, but failed to detect any evidences of tuberculosis in either the internal organs or glands. The penis, testis, and vasa deferentia were free from tubercles. The abscess cavities appeared to be purely subcutaneous in location, and showed no evidences of tubercles or caseous masses in their vicinity. The bodies of the vertebræ were free from tubercles. As the meat was intended for sale, the muscles and inter-muscular planes were only examined as far as could be done while the carcass was being dressed.

My notes of the inoculations are as follows :

March 16th. One of the rabbits shows panophthalmitis. In the other two the corneal wound is nearly healed, but slight plastic-iritis persists.

March 18th. Examined sections made through the portions of the abscess wall after hardening in alcohol. These showed a superficial necrotic zone surrounded by granulation tissue formed of small round cells. No giant cells. A large number of sections were examined for tubercle bacilli, without finding any.

(This examination was again repeated on April 24th, still with a negative result. The absence of actinomyces was also confirmed.)

April 11th. One of the guinea-pigs has been wheezing for a week and losing flesh rapidly. Died to-day. Autopsy : Over parietal peritoneum a few pearly-gray nodules. Omentum shows small gray granulations with opaque centres. Spleen contains yellow-white opaque nodules about the size of split peas. Microscopic examination of sections of the spleen shows a few tubercle bacilli in every field.

April 24th. All the animals killed to-day. The control animals found to be free from tuberculosis. The two remaining guinea-pigs

present similar conditions to the one which died on April 11th, tubercle bacilli being found in the spleen in each case.

The three rabbits all showed extensive tuberculous inflammation in the region of the iris. Tubercle bacilli were found in each case. Two of the rabbits showed caseous nodules in the lungs and spleen, which contained numerous tubercle bacilli.

I have reported this case in detail because I have not been able to hear of a similar one where the disease was limited in this peculiar manner.

It is of interest, owing to the conclusive results of the inoculation experiments, when a most careful microscopical examination had failed to detect tubercle bacilli. The apparently purely local nature of the lesions is also interesting. It is seldom that an opportunity of examining a valuable animal, post-mortem, is insisted on by the owner in such an obscure case. From the appearance of the abscess wall it is probable that recovery would have been complete had the animal been allowed to live.

Unfortunately, the suspicions of the owner were well grounded, and he lost in the following year a valuable cow from tuberculosis. In this case a large fungating ulcerating growth as large as an egg projected from the vocal cords, and Dr. J. B. Paige, of Amherst, who examined the organs, was able to demonstrate masses of tubercle bacilli actually in pure culture in necrotic spots from the larynx and liver.

It would have been preferable had I also made inoculations with material taken from the abscesses at the time of the autopsy, under aseptic precautions. The fact, however, that of the material sent me six separate samples each gave positive inoculation results, seems to leave no doubt that the infection was in no way due to extraneous contamination. It must be remembered that at the time of the autopsy we came to the conclusion that the case was not one of tuberculosis, and therefore no further confirmation was sought.

The fact that two separate cases of tuberculosis, in unusual localities in this herd, occurred within a year, seems to indicate some unusual source of infection. None of the farm hands were tuberculous as far as could be learned. Possibly the infection may have been accomplished through the agency of some smaller animals, rodents, for instance, about the farm, in which tuberculosis would not be suspected. The fact that no subsequent cases appeared in the herd this year points to some transient source of infection of an unusual character.

I have been unable to find an exact analogous case in the valuable statistical table published by Rockl (*Veterinar., der Tubercul. unter dem Rindreich im Deutschen Reiche*, 1891). The condition was, of course, readily distinguishable from the "Farcin du Rocap" described and figured by Nocard (*Annales Pasteur*, 1888, p. 293). It must be borne in mind that the above examination was made in the pre-tuberculin days.

PROCESSES OF REFRIGERATION USED FOR DRESSED BEEF IN TRANSPORTATION, ETC.

BY WILLIAMSON BRYDEN, V.S.

A FEW weeks ago Professor Schwartzkopff, chairman of the "Food Inspection" section of this organization, requested me to give a sketch of the processes of refrigeration used for dressed beef in transportation, etc. I only regret my inability to comply with the technical exactness the subject deserves.

Within the last fifteen years a vast amount of business in the transportation of fresh meats, fowl, fish, and even fruit and vegetables, has been done that would have been impossible had it not been for the great improvements made in refrigeration, in cold storage, and in the wonderful systems that have been organized for the sale and distribution of fresh products. Formerly, meats had to be *salted* or *frozen* in the *north*, or *dried* in the *south*; now, the United States, New Zealand, Canada, Australia, and the River Plate dispose of such products in the markets of Great Britain in a condition as fresh and sound as when killed.

At first, *ice* and *common salt* were used as refrigerants, and succeeded sufficiently well to demonstrate the possibility of carrying successfully dressed meats from Chicago to Liverpool; then, however, it was necessary to use the meat as soon as possible after the exposure incident to its removal from the ship refrigerators, where it had been kept at a temperature of from 33° to 37° F., or thereabouts.

As the business increased, being in the hands of enterprising men, who were not long satisfied to supply the ports of landing only, they in a short time had their goods in every inland city of Great Britain.

To accomplish this required cold-storage warehouses convenient to the docks, lines of refrigerated cars for inland transportation, and conveniences for its sale in every town. While this was being gradually consummated the attention of scientific men was being

directed to the necessity for some process of refrigeration less expensive and that would produce a lower temperature than the old *ice and salt mixture*, which had sometimes proved unreliable in the hottest months. It was a process prodigal of valuable space, so important on ships, when freights are high, from the fact that (1) the ice and salt for use on the ocean voyage, (2) the room for the boxes containing the ice and salt mixture, and (3) the alley-ways between, and at the ends, of the rows of beef for the circulation of the cold air and for the men in charge to work, took up about one-third of the cubic space in the beef chambers.

An exact technical description of the different processes of preserving fresh beef, to which this article principally applies, I cannot give, neither will I weary you with the different processes of ice-making, the machinery invented to accomplish it, or to making and applying the different freezing mixtures; the history of these would date back many years. It may be stated, however, that the machines that have so far proved the best adapted for the trade on steamships have been those which utilize the lowering of temperature caused by sudden expansion of a compressed gas, and by those that make use of a like effect when a liquid becomes volatilized.

Steamships sailing from Boston are equipped mostly either with what is called the "Haslam," or cold blast, or with the "Kilburn," a type of the ammonia process, in which anhydrous ammonia is used, and which at 15 absolute pressure has a boiling-point 72 below the freezing-point of water. The mechanical part consists of a condenser and a refrigerator, both made of welded steel, and containing coils of iron pipes; also two pumps, one for condensing the ammonia with the sea water, the other for circulating the brine; and two compressors.

The supply of ammonia is kept in a drum; when the machine is charged this ammonia first enters the *refrigerator*, from which it is forced into the *compressor*, then into a coil in the *condenser*; here it is subjected to a deluge of cold water which circulates within the shell of the *condenser*; this partly cools the condensed ammonia, which has become very hot. By the action of the compressor-pump the pressure on the liquid is removed, and it enters the shell of the refrigerator in the form of a gas or vapor which has become intensely *cold* from its sudden expansion. The refrigerator contains a coil of pipes continuous with the galvanized pipes in the beef boxes; in these a brine made of chloride of calcium—which can be frozen only at a very low temperature—is kept in circulation by the brine pump, until a heavy

coating of ice has formed on the pipes in the boxes ; as this brine returns from the beef boxes the ammonia vapor in the shell cools it.

Several years ago I was engaged, for a couple years or so, inspecting beef for shipment on ships where both the ice and salt and the Kilburn processes were used. Beef had been arriving in Liverpool in poor condition, and some misunderstanding between the manufacturers of the machines, the beef company, and the steamship company was the result

The machines had been tested in spring, when the sea water was from 40 to 50 Fahrenheit, and worked very well ; but in mid-summer, when the water in the harbor and in the Gulf Stream reached over 70, the beef boxes proved to be either too large or the machines too small or weak. My inspection was expected to reveal whether any neglect or mismanagement of the beef, after slaughtering or on the land journey to the ships, had occurred which might, in part at least, be responsible for the quality and condition of the beef at its destination.

My duties were, therefore, to discover, if possible, (a) if the cattle were healthy and in condition to be slaughtered ; (b) the carcasses properly cooled and the animal heat all removed before shipment ; (c) the cars in such condition and temperature as proved that they had been fit to load, properly recharged with ice and salt at the charging stations along the route, and that they had not been sidetracked or delayed under a burning sun on the journey to port.

Ice and salt are used on the cars, and there is a box at each end of the car which is charged through the roof ; each car carries about one hundred quarters of beef, which is hung from hooks—half fore and half hind quarters—a few boxes of tongues being sometimes added. The loaded cars arrive one or two days before the ships sail, and the beef is transferred to the beef boxes on the ships as expeditiously as possible, and before the ice formed on the brine pipes begins to drip or melt.

The machinery being idle on the return voyage, it become necessary to start it up a sufficient length of time before receiving the beef to reduce the temperature of the beef boxes on the ship so low that the ice formed on the brine pipes will not melt while the process of loading is going on. This depends on the size of the machine, the size of the beef boxes, and the temperature of the sea water used in the ammonia-condenser.

Before proceeding to open the cars the following temperatures had to be taken : (1) Temperatures of the beef boxes on the ship

before opening ; (2) air ; (3) sea water, in going and returning ; (4) brine, in going and returning. The same are taken when the boxes are closed, and they cannot be opened until their arrival at Liverpool. The boxes hold from 1000 to 2000 quarters. Some of the ships are equipped with more than one box, and carry over 3000 quarters. I may here add that the refrigeration of mutton and lamb is different, from the fact that it can be frozen, while beef is best kept just above freezing. Lines of sailing ships are engaged carrying mutton, etc., from Australia, New Zealand, and the River Plate, some of their cargoes reaching as high as 80,000 carcasses.

On proceeding to examine the beef in the cars I armed myself with half a dozen or more beef thermometers, about three times as large as our clinicals, very strong, and with a scale of from 20 to 70 Fahrenheit, a skewer, and as many more ordinary weather thermometers. The beef thermometers were allowed at least five minutes, and the others at least fifteen minutes. On the car door being opened I entered, the door was closed on me, the thermometers inserted in the beef, and the others placed within some eighteen inches of the top, and others the same distance from the floor. The beef was also handled to detect soft spots or smell, and the sides of the car for moisture, etc. A record of all these was kept and reported to Liverpool.

On land some refrigerators of a somewhat similar principle have had artesian wells bored to obtain water at a temperature of about 50 Fahrenheit for the hot months.

I regret being unable to give you a more exact and technical description of this interesting subject. It will serve, however, to illustrate one of the many duties the veterinarian may be called upon to perform outside of his regular profession.

NOTE.—It was nothing unusual for one steamship to take 3000 quarters of dressed beef and over 1000 live bullocks.

THE USE OF MALLEIN FOR THE DIAGNOSIS OF
GLANDERS IN HORSES, AND EXPERIMENTS
WITH AN ALBUMOSE EXTRACTED
FROM CULTURES OF THE
BACILLUS MALLEUS.

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IN December, 1890, we extracted from culture liquids of the bacillus malleus an albumose which appeared to be the active principle in these cultures. At that time a preliminary experiment was conducted to see if this substance could be used in making guinea-pigs immune to the disease of glanders. The result was that out of a set of five, three vaccinated, and two checks, only one, a vaccinated animal, recovered from an inoculation of a glanders culture. This experiment has since been repeated on sets of ten and twelve guinea-pigs each, with, at the present writing, only negative results. A note of this work was published in the annual report of the Department of Agriculture for 1891. The albumose was best obtained from the cultures, after the removal of the germs by means of a Pasteur filter, by precipitation with absolute alcohol, resolution in water and reprecipitation.

In the July number, 1892, of the *Archives des Médecine Expérimentale et d'Anatomie Pathologique*, A. Babes describes the isolation in the same way of apparently the same substance from glanders cultures. He claims with this to have been able to immunize against glanders. He has either failed to see or note our earlier experiments.

During the present year, we have, at the direction of Dr. D. E. Salmon, turned our attention to the use of mallein as a means of diagnosing glanders. In the experiments made by Preusse, Nocard,¹

¹ Nocard: Recueil de Méd. Veter., 1892 No. 8, p. 209.

Tietze,¹ Eber² and others, the mallein used was prepared by scraping the surface-growth from potato cultures, dissolving in water, sterilizing by heating to 100° C., filtering, and injecting upon the addition of an equal volume of a 2 per cent. solution of carbolic acid. Our mallein was prepared in the following way: Acid peptonized beef (broth) cultures containing 5 per cent. of glycerin were inoculated with the glanders bacillus, and the cultures allowed to grow for two months at the temperature of the room. At this time the growth, which had been very abundant, had almost entirely ceased. The liquid was then heated for two hours from 80 to 100° C., after which it was filtered through a Pasteur tube to remove the germs. The resulting clear amber liquid, after being tested to prove the absence of germs and diluted with 50 per cent. of glycerin for better preservation, was used for injections. A purer lymph was obtained by the precipitation of the filtered cultures with absolute alcohol and resolution in 50 per cent. glycerin. For practical purposes the crude lymph is equally as good. The greatest care and precautions have to be observed in all of the work, that the cultures are pure, of the proper age, and that the lymph is perfectly sterile, and can be so preserved. Care must also be observed in making the injections to avoid the danger of contamination or infection by means of the syringe.

The value of the mallein, prepared as described, as a diagnostic agent for glanders in horses, has been extensively tried at the Experiment Station of the Bureau of Animal Industry and also by Drs. Francis of Texas, Dinwiddie of Arkansas, and Casewell of Chicago.

Lymph was also sent to several other experiment stations and veterinarians, but they have as yet failed to report. The results of these tests are recorded in the tables following this article.

As sent out for use the lymph is diluted with an equal volume of glycerin, so that it will keep better.

The amounts of mallein named in the charts refer to the undiluted solution. Of the diluted solution just double the quantity was given.

At first we made injection of 1 cc. of the mallein (2 cc. of the 50 per cent. solution), but finding this to be apparently too large a dose, sometimes giving a decided febrile reaction in healthy horses, we have decreased the dose to 0.5 cc. of the mallein or 1 cc. of the 50 per cent.

¹ Tietze: Berl. Thierarz. Woch., 1892, No. 8, p. 86.

² Eber: Recueil de Méd. Veter., 1892, p. 86

solution. But judging from the results being obtained from some experiments now in progress we may find it desirable to return to the larger dose, and depend on a second injection of those horses which give a doubtful reaction for a positive diagnosis. In several instances the same horses have been repeatedly injected. To indicate this in the charts a figure in brackets is placed over the head of the column showing temperatures. The figure indicates the number of times the horse has been injected.

Except a few of the earlier injections, which were made over the shoulder, we have made the injection near the middle of one side of the neck, where any local swelling can be readily detected. In our experiments the local reaction or swelling on the glandered horse has been more constant and fully as characteristic as the febrile reaction.

The following notes refer to the tests made with mallein as reported in Table I. :

The numbers correspond to the numbers of the horses. The notes were recorded by the veterinarians making the tests.

Horse No. 1. Horse was seven or eight years old. The right submaxillary gland was enlarged, there was a discharge from the right nostril, but no farcy buds. The condition of the animal was good. The day after the injection there was an increased flow from the right nostril and a painful enlargement at the point of injection.

Horse No. 2. Horse was six or seven years old. Both submaxillary glands were enlarged and there was a slight nasal discharge. The condition of the animal was good. It had been affected six or seven months. There was an enlargement at the point of injection.

Horse No. 3. This animal was four years old. Both submaxillary glands were enlarged, but there was no nasal discharge. Right hind leg swollen. There were thirteen farcy buds. The general condition was poor.

Horse No. 4. The condition of the animal was fair, and there were farcy buds on front legs and on the breast. The respiration was labored. There was no nasal discharge. The submaxillary glands were not enlarged, but the left eye was mattering. Dr. Francis diagnosed a probably mild pneumonia in addition to the farcy.

Horse No. 5. Horse was about nine years old. Both submaxillary glands were enlarged. There was some nasal discharge. Condition of the animal was very bad. Farcy buds and chancres on both hind legs. Veins of fore-legs enlarged. The animal urinated frequently.

Horse No. 6. This animal was perfectly healthy.

Horse No. 7. This animal was six years old, in good flesh. She had been exposed to glanders about five weeks before the injection. She was suckling a foal. The foal was kept from her for twelve hours previous to taking her temperature before injection. After injection and during the test the foal was returned to her.

Horse No. 8. This animal was a two-year old filly diseased with glanders, in good flesh, and apparently feeling well. The owner insisted upon having her shot immediately after the temperature was taken the last time.

Horse No. 9. This animal was an aged mare which had been exposed to glanders five weeks before the injection. She was in very good flesh and condition.

[Horse No. 10. This was a three-year old entire horse, small sized, well nourished, healthy. A painful swelling formed at point of injection in four hours, and persisted forty-eight hours. Maximum temperature was reached ten hours after injection and was 1.7° F. above that at the same time the previous day.

Horse No. 11. This was a four-year old gelding in fair condition, healthy, weight 1050 pounds. The local swelling persisted for two days and temperature rose to 0.7° above that at the same time the previous day.

Horse No. 12. This animal was an old mare with chronic glanders, both lung and nasal lesions. Irregular temperature, usually above normal. Large local swelling for two days. Maximum temperature was reached twelve hours after the injection, and was 2.2° above that of the corresponding time the day before.

Horse No. 12. Reinjected. Maximum temperature was reached ten hours after making the injection, and was 2.5° above that at the corresponding time the day before. The local swelling persisted for three days.

As for the notes on the horses which were injected by this Bureau, all of which were kept very carefully, it is not necessary to go into detail here. In general we may say that the glandered horses, except No. 14, were pronounced cases of the disease, having been condemned for glanders and farcy from the District of Columbia and sent to the Veterinary Station to be destroyed. Nos. 7, 23, 25, 31, 34, 35, and 39, were cases of glanders with well-marked nasal lesions. Nos. 10, 19, 20, 21, and 26 showed only symptoms of farcy (although No. 19, developed nasal lesions after the injections.) The only symptoms shown by No. 14 before the injection were an elevated tempera-

ture, 101° F. to 102.5° F., and an enlarged rounded (not nodular) left submaxillary gland, with a history of coming from a stable from which two horses were removed and condemned for glanders, September 21, 1891. From this date until February 13, 1892, the mare continued in excellent condition and the best of spirits, with no perceptible change in the above symptoms, although freely purged with aloes three times during this period. Two days after the first injection there appeared a slight nasal discharge, followed by an attack of acute glanders, the animal dying March 26.

Guinea-pigs were inoculated from farcy buds or with the nasal discharge from horses numbered 7, 20, 23, 25, and 26, the pigs so inoculated all contracting glanders.

The healthy horses used, Nos. 8, 9, 11, 12, 13, 15, 16, 17, 18, 22, 24, 27, 29, 30, 33, 36, 37, and 38, were in general in good condition at the time of the experiments.

The glandered horses, except those with a high temperature at the time of the injections (Nos. 34, 35, and 39), all showed a marked rise in temperature in from four to eight hours after the first injection, and usually even after repeated injections with the mallein. The maximum temperature was usually reached in from 10 to 16 hours after the injection. Further there was in all cases a characteristic, very tender, abrupt swelling at the point of the first injection, and also at all subsequent injections except in Nos. 19, 20 (ninth injection) and 34, generally beginning to appear two to four hours after the injection, continuing on the next day and increasing in size for from one to three days, disappearing again three to nine days after the injection.

Some of the healthy horses showed a slight rise of temperature (No. 8 a marked elevation) upon the first injection, but only in one instance, horse No. 38, did this rise persist on the second injection. This horse has unfortunately been lost sight of and sold. It was to all appearances free from the disease when hired for injection, but the rise in temperature upon two successive injections would look suspicious, although it did not show the characteristic swelling of glanders after either injection. In the healthy horses in no instance was there any marked swelling at the seat of the injection of doses not exceeding 1 cc. of the mallein. When it did appear it developed in two to six hours after the injection, and had disappeared again by the next day.

Horse No. 7 received a daily injection of 1 cc. of the mallein from May 11 to June 23, inclusive. During this time there was no ele-

vation of temperature, which ranged from 99.5° F. to 101.6 F. But after each injection a local swelling appeared, varying in extent from six to ten inches across and disappearing at the end of the third day. During the last week of the injections the swellings were less marked, but still invariably followed each injection. Otherwise no effect was noticed from the continued injections.

On horse No. 21 the farcy buds had entirely healed within a week after the the first injection, and on No. 20 the extensive farcy swellings had all healed July 15. Except a slight discharge from the left ear of No. 20, these two animals have continued apparently entirely well, and have improved in general health since the above dates. However, the last injections of the mallein, August 27 and 30, caused a decided rise in temperature and a marked characteristic swelling at the point of injection, which would indicate that the horses are not free from the disease.

Table V. shows the effect upon horses of the albumose extracted from the cultures. In the first of these experiments the amount used, 0.005 grams, was evidently entirely too large, causing almost as much reaction in the healthy as in the glandered horses. In the second and third experiments the dose was reduced to 0.002 grams per horse, but here it was also slightly too large. This table serves to show the powerful effect of the poison secreted by the glanders bacillus. A dose of only 0.001 grams of the albumose would probably be sufficient to give a decided reaction.

In conclusion, the tests made show that mallein is of a great value in the diagnosis of glanders in horses. The injection of 0.5 or 1 c.c. of the mallein may cause a slight rise of temperature in a healthy horse, but it will very rarely give a reaction upon a second injection, and there does not occur on a healthy horse any marked swelling at the seat of injection. On the glandered horse the first injection always gives a marked febrile reaction (except as noted above) and a large painful swelling at the seat of injection. Subsequent injections also give a similar reaction, although frequently less marked. Healthy horses readily acquire an immunity to large doses of the mallein not so acquired by glandered horses.

The active principle in mallein is an albumose which can be precipitated from the cultures by means of alcohol or ammonium sulphate, and is very active.

Further experiments may prove that a preventive injection or treatment of glanders in horses is possible.

The directions which were sent out to serve as a guide in testing

the value of the mallein may be conveniently given here for future reference.

*Directions for Using Mallein as Prepared by the Bureau
of Animal Industry.*

Make the test, if possible with a healthy horse as well as with one or more affected with glanders. Take the temperature of all these animals three times a day for one or two days before making the injection. On the day of making the injection take the temperature every two hours from early in the morning until late in the evening. Use for each horse one cubic centimetre of the solution as sent you, and make the injection beneath the skin of the shoulder. Be careful and thoroughly sterilize the syringe after injecting each horse, or better, use separate syringes for healthy and suspected animals. If the same syringe must be used, inject the healthy animals first, and thoroughly sterilize the syringe after each of the other injections. Sterilize the thermometer in carbolic acid after taking the temperature of each horse. The temperature will begin to rise, as a rule, from three to four hours after the injection, and reach its maximum eight to ten hours after injection. On the two days succeeding the injection, take the temperature three times a day. Note the general condition of the animal both before and after the injection. After four or five days the injection should be repeated.

Keep the solution in a sealed bottle and in a cool place. As sent from here it is free from germs.

So far as we have experimented, the mallein has caused a rise in the temperature of all horses affected with glanders; but it is possible that it also, in rare instances, causes a rise in the temperature of horses that are not affected with this disease. We deem it very important that this latter point should be definitely determined by a considerable number of observations.

TABLE I.—EXPERIMENTS WITH 1 C.C. MALLEIN.

Tests by M. FRANCIS, College Station, Texas.

	Date.	Time.	No. 1	No. 2	No. 3	No. 4	No. 5	Date.	No. 6 (Healthy).	
			Temp.	Temp.	Temp.	Temp.	Temp.		Time.	Temp.
Before injection.	July 19	9 a.m.	100	99.9	100.6	102	101.6	July 24	9 a.m.	99.8
	"	2 p.m.	100	100.6	101.6	102.2	101.8	"	4 p.m.	100.2
	"	5.30 "	100.6	100.7	101.6	102.2	101.8	"	6 "	100.2
	July 20	9 a.m.	100	99.9	100.9	104.4	101.4			
	"	2 p.m.	100.4	100.6	101.9	102.9	101.8			
			Inj. 1 c.c. 7 A.M.	Inj. 1 c.c. 7 A.M.	Inj. 1 c.c. 7 A.M.	Inj. 1 c.c. 7 A.M.	Inj. 1 c.c. 7 A.M.		Inj. 1 c.c. 7 A.M.	
When injected.	July 21	9 a.m.	100	100	100	102.5	101.4	July 25	8.30 a.m.	99.8
	"	11 "	102.4	102	101.8	102.9	102.3	"	10.30 "	100.2
	"	2 p.m.	103.5	102	103.5	103.5	102.7	"	12.30 p.m.	100.1
	"	5 "	104.2	103.4	103.9	103.5	102.8	"	2.30 "	101
	"	6.30 "	103.5	104	104.2	103.1	103.4	"	4.30 "	101.4
								"	6.30 "	101.8
								"	8.30 "	101
			swell- ing at point of inj.	Swell- ing.	Swell- ing.	Swell- ing.	Swell- ing.		No swell- ing.	
After injection.	July 22	10 a.m.	103	101.9	101.5	103.8	102.3	July 26	6.30 a.m.	99.8
	"	2 p.m.	103.2	102	102.4	102	103.8	"	8.30 "	100
	"	5.30 "	102.2	101.5	102	101.5	102.2	"	10.30 "	100.8
								"	12.30 p.m.	100.2
								"	2.30 "	100
								"	4.30 "	100
								"	6.30 "	100

Tests by JOHN CASWELL, Chicago, Ill.

	Date.	No. 7 (Healthy).		No. 8		No. 9 (Healthy).	
		Time.	Temp.	Time.	Temp.	Time.	Temp.
Before injection.	July 12	8 a.m.	100.4	8 a.m.	102.4	8 a.m.	100
	"	11 "	100.4	12 m.	100.4	11 "	100.2
	"	5.30 p.m.	100.6	6 p.m.	101.2	5.30 p.m.	100.4
When injected.	July 13	8.30 a.m.	100	8.30 a.m.	100.8	8.30 a.m.	100
	"	10.30 "	100.2	10.30 "	101	10.30 "	100.2
	"	12.30 p.m.	100.8	12.30 p.m.	102.4	12.30 p.m.	101.4
	"	3 "	100.8	3.20 "	104.8	3 "	100.6
	"	6 "	100.4	5 "	104.8	6 "	100.4
After injection.	July 14	8.30 a.m.	100.2	8.30 a.m.	105.4	8.30 a.m.	99.8
	"	3 p.m.	100	3 p.m.	103.4	3 p.m.	99.8
	"	5.30 "	100	5 "	102	5.30 "	99.8

TABLE I.—Continued.
Tests by R. R. DIXWIDDE, Fayetteville, Ark.

No. 10 (Healthy).				No. 11 (Healthy).				No. 12 (Reinjected (?)).			
Date.	Time.	Temp.		Date.	Time.	Temp.		Date.	Time.	Temp.	
Before injection.	April 4	9 a. m.	99.6	April 8	9:30 a. m.	99.2	April 12	April 18	99.9	101	
	"	3 p. m.	100.8	"	2 p. m.	100	"	"	98.7	101	
	April 5	6:20 a. m.	100.1	April 9	6:30 "	100.2	"	"	100	101.3	
	"	8:20 "	99.8	"	10 "	100	"	"	100.9		
	"	10:20 "	99	"	9:30 p. m.	99.9	"	"	100.9		
When injected.	"	12:20 p. m.	99.5	"	8 "	100.6	"	"	101		
	"	2:20 "	100	"	10 "	100.4	"	"	101.7		
	"	4:20 "	100.3						101		
	"	6:20 "	100.5						101		
	"	8:20 "	100.3						101		
				Inj. 1 c.c. at 6:20 a. m.				Inj. 1 c.c. at 6:30 a. m.			
After injection.	April 6	6:20 a. m.	99.2	April 10	6:45 a. m.	99.3	April 13	April 19	100.3	100.4	
	"	8:20 "	99.2	"	8:45 "	99.8	"	"	100.6	100.8	
	"	10:20 "	99.4	"	10:45 "	100	"	"	101.3	101.7	
	"	12:20 p. m.	100	"	12:45 p. m.	99	"	"	101.9	101.9	
	"	2:20 "	101.3	"	2:45 "	100.3	"	"	102.9	102.7	
After injection.	"	4:20 "	102	"	4:45 "	100.2	"	"	103.8	103.8	
	"	6:20 "	101.8	"	6:45 "	101	"	"	103.9	103.5	
	"	8:20 "	101.4	"	8:45 "	101.8	"	"	103		
	"	10:20 "	101	"	11 "	101.2	"	"			
	April 7	6:20 a. m.	99.8	April 11	6 a. m.	99.9	April 14	April 20	101.3	101.6	
After injection.	"	12:20 p. m.	99.4	"	10:20 "	99.9	"	"	101.3	102.1	
	"	4:20 "	99	"	2 p. m.	99.8	"	"	101.9	103	
	April 8	9 a. m.	99	"	4:20 "	100	"	"	101.9		
	"	1:50 p. m.	99.1	"	10:30 "	100	April 15	"	101.5		
	"	6:15 "	100				"	"	100		
								Inj. 1 c.c. at 5:40 "			

TABLE II.—EXPERIMENTS WITH MALLEIN—continued.

IV.—Continued.				V.				VI.								
		No. 9 (h'thy) reinj.(2)	No. 11 (h'thy)	No. 12 (h'thy)	No. 10 (farcy) reinjected (3)		No. 14 (glandered).		No. 8 (h'thy) reinj.(3)	No. 13 (h'thy)	No. 15 (h'thy)	No. 14 (glandered mare) reinjected (2).		No. 13 (h'thy) reinj.(2)	No. 16 (h'thy)	
Date.	Time.	Temp.	Temp.	Temp.	Date.	Time.	Temp.	Temp.	Temp.	Temp.	Temp.	Date.	Time.	Temp.	Temp.	
Feb. 7	9 a. m.	100	100.5	99.8	Feb. 12	9 a. m.	100	102.4	100	100.6	101.8 ¹	Feb. 17	9 a. m.	103.6	98.8	
"	1 p. m.	100.6	101.2	100.2	"	1 p. m.	101	101.8	100.5	101	102	"	1 p. m.	103	99.5	
"	5 "	100.5	101.2	99.8	"	5 "	101.6	101.8	99.8	100.6	101.6	"	5 "	103	100	
												Feb. 18	8 a. m.	101.5	98.6	
		1 c.c.	1 c.c.	1 c.c.		1 c.c.		1 c.c.	3 c.c.	1 c.c.	1 c.c.		1 c.c.	1 c.c.	1 c.c.	
Feb. 8	8 a. m.	100	101	100	Feb. 13	8 a. m.	100.2	101.3	100.4	100.4	101.6	Feb. 18	10 a. m.	101.2	98.0	
"	10 "	100.5	101.2	99.8	"	10 "	100.6	101.6	99	100.6	101.8	"	12 m.	101	98.9	
"	12 m.	100.5	100.8	100.2	"	12 m.	100.6	101.6	100.4	101	100.8	"	2 p. m.	101	98.8	
"	3 p. m.	100.2	100.4	100	"	2 p. m.	101.8	102.2	100.8	100.8	101.8	"	4 "	102.2	99.4	
"	6 "	101	100.8	100	"	5 "	103.2	104.8	100.8	101.6	102.8	"	7 "	102.2	99.4	
"	9 "	100.8	101.2	100.2	"	10 "	103.2	106	98.4	101.2	101.5	"	10 "	101.8	98.8	
"	12 mid.	101.8	101.2	100.4	"	12 mid.	104.4	105	100.4	102	101.2					
		1 c.c.	1 c.c.	1 c.c.		1 c.c.		1 c.c.	1 c.c.	1 c.c.	1 c.c.					
Feb. 9	8 a. m.	99.8	100.5	100.1	Feb. 14	8 a. m.	101.4	103.4	100.4	100	101	Large swelling.			No swelling swelling	No swelling swelling
"	1 p. m.	100.9	100.8	99.8	"	1 p. m.	101.8	104	99	100.6	101.6	Feb. 19	8 a. m.	101.5	99.8	
"	5 "	100.8	101.2	100	"	5 "	102	103.2	100.8	100.6	101.6	"	1 p. m.	101.5	100	
Feb. 10	8 a. m.	101.2	101.2	100	Feb. 15	8 a. m.	100.6	103.2	100.6	100.6	101.6	"	5 "	102.4	99.8	
"	1 p. m.	100.8	101.3	99.8	"	1 p. m.	100	102.6	99	100.8	100.8	Feb. 20	8 a. m.	103.6	99.4	
"	6 "	100.8	101.2	100.2	"	5 p. m.	100.6	103.8	99.9	100.9	101.2	"	1 p. m.	103.2	100	
		1 c.c.	1 c.c.	1 c.c.	Feb. 16	8 a. m.	100	102.8	99.9	100.8	101.2	"	5 "	103.8	100.4	
					"	12 m.	100	102.8	100	100.8	101.2	Feb. 21	8 a. m.	102.6		
					"	5 p. m.	100	102.4	99.8	100.2	101	"	5 p. m.	102.6		
					"	5 p. m.	100	102.4	99.8	99.8		Feb. 22	8 a. m.	103.8		

1 Mare in heat.

TABLE III—EXPERIMENTS WITH MALLEIN—continued.

X.				XI.				XII.					
No. 19 (glandered reinj. (3))		No. 11 (healthy reinj. (3))		No. 20 (farcy)		No. 15 (healthy reinj. (2))		No. 20 (farcy) reinj. (2)		No. 21 (farcy)		No. 15 (healthy reinj. (3))	
Date.	Time.	Temp.		Date.	Time.	Temp.		Date.	Time.	Temp.		Date.	Temp.
Before injection	April 25	9 a. m.	101	May 23	8 a. m.	100.2	101	May 27	12 m.	101.2	100.8		100.4
	"	1 p. m.	101.3	"	12 m.	100.6	100.8	"	5 p. m.	102.4	100.4		100.4
	"	5 "	102.4		5 p. m.	101	98.5						
			1 c.c.				1 c.c.				1 c.c.		
When injected	April 26	6 a. m.	103.6	May 24	6 a. m.	99.4	101.2	May 28	6 a. m.	101.6	100.6		100.4
	"	8 "	103	"	8 "	100.2	100.6	"	8 "	101.4	100		100.2
	"	10 "	102.8	"	10 "	101.2	100.6	"	10 "	102	100		100.2
	"	12 m.	102.4	"	12 m.	100.6	100.8	"	12 m.	101.4	100		100.6
	"	2 p. m.	101.8	"	2 p. m.	102.4	101.2	"	2 p. m.	101.6	101.6		100.8
	"	4 "	102.2	"	4 "	101.4	102	"	4 "	101.8	102.6		101
After injection	"	6 "	102.8	"	6 "	103.8	101.8	"	6 "	101.8	104.3		101.7
	"	8 "	102	"	8 "	104.8	102.4	"	8 "	104.8	104.4		104.4
	"	10 "	102.8	"	10 "	104.9	101.8	"	10 "	101.7	104.4		101.6
			1 c.c.				1 c.c.				1 c.c.		
			Slight swelling.				Slight swelling.				Very large swelling.		
			101.6				103				102.4		
			101.4				102.8				102.9		
			102.4				102.4				101.4		
							100.8				103.2		
							102.2				101.8		
							101.8				102.6		
							102.6				102.4		

1 Mare in heat.

TABLE IV.—EXPERIMENTS WITH 0.5 C.C. MALLEIN.

I.										II.									
			No. 25 (glandered (healthy)).	No. 26 (glandered (healthy)).	No. 27 (healthy).			No. 20 (farcy) inject. (s)	No. 21 (farcy) inject. (s)	No. 34 (glandered (healthy)).	No. 35 (healthy).	No. 36 (healthy).	No. 37 (healthy).	No. 38 (healthy).					
Date.	Time.	Temp.	Temp.	Temp.	Temp.	Date.	Time.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.					
Before injection	July 10	8 a. m.	101.2			Aug. 26	6 a. m.	99.4	99.9	102.3	101.8	99.2	99.0	100					
	"	5 p. m.	101.4			"	12 m.	100.4	100.5	102.8	102.8	99.9	100.4	100					
	July 11	8 a. m.	101.4	102	99.6	"	6 p. m.	100	99.6	102.8	104.3	99.9	100.8	100.2					
	"	1 p. m.	101.4	101.8	99.8														
	"	6	101.4	101.8	99.4														
			Injected 0.5 c.c.	Injected 0.5 c.c.	Injected 0.5 c.c.				Injected 0.5 c.c.	Injected 0.5 c.c.	Injected 0.5 c.c.	Injected 0.5 c.c.	Injected 0.5 c.c.	Injected 0.5 c.c.					
When injected	July 12	6 a. m.	101.2	101.2	99.4	Aug. 27	6 a. m.	99.6	99.4	102	101.8	99.6	100.2	100.2					
	"	8	101.8	101.6	99.2	"	8	99.8	99.7	101.8	101.6	99.1	98.5	99.4					
	"	10	101.4	101.2	99.8	"	10	100.3	100.3	101.3	101.4	99.4	98.8	99.0					
	"	12 m.	101.6	101.8	99.2	"	12 m.	100.8	100.8	102.1	102.2	99.4	98.9	100.4					
After injection	July 13	8 a. m.	101.8	100	100.2	Aug. 28	6 a. m.	101.4	101	102.4	102.4	99.0	101.2	100.4					
	"	12 m.	101.6	100.6	100.4	"	1 p. m.	102.9	102.9	102.2	102.4	99.8	100.8	100.3					
	July 14	8 a. m.	100.7	100.7	99.8	Aug. 29	6 a. m.	100	99.4	102.6	102.8	99.8	100.8	100.2					
	July 15	4 p. m.	99.8	100.2	100.2	"	6	100.2	100.2	102.2	102.8	100.2	100.4	100.2					
			Swelling.	Large swelling.	Swelling barely perceptible.				Swelling.	Large swelling.	Large swelling.	Slight swelling.	Slight swelling.	Slight swelling.					

TABLE IV.—EXPERIMENTS WITH 0.5 C.C. MALLEIN—continued.

III.

Date.	Time.	No. 20 (fary) reinfected (9).		No. 21 (fary) reinfected (7).		No. 34 (glandered) reinfected (2).		No. 35 (glandered) reinfected (2).		No. 30. (glandered).		No. 33 (healthy) reinfected (2).		No. 36 (healthy) reinfected (2).		No. 37 (healthy) reinfected (2).		No. 38 (healthy) reinfected (2).	
		Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.	Temp.
Aug. 29	7 a. m.	100	99.4	100.8	100.8	102.6	99.2	100.2	100.2	102.6	99.2	100.2	100.2	100.2	99.8				
	1 p. m.	100.2	99.8	102.2	102	102.4	99.6	100	100	102.4	100.4	100.4	100.4	100.2	99.8				
	6 "	100.2	100.2	103	102.8									100.2	100.2				
		Injected	Injected	Injected	Injected	Injected	Injected	Injected	Injected	Injected	Injected	Injected	Injected	Injected	Injected			Injected	
		0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.	0.5 c.c.			0.5 c.c.	
Aug. 30	6 a. m.	99.4	99.2	102.4	100.6	101.8	99.2	100.4	100.4	101.8	99.2	100.4	100.4	100.4	100			100	
	8 "	99.8	100.8	102.7	100.5	101.5	99.2	100.2	100.5	101.5	99.2	100.2	100.2	100.2	100			100	
	10 "	100.4	101.4	102.5	100.5	102.5	99.6	100.2	100.5	102.5	99.6	100.2	100.2	100.2	100.2			100.2	
	12 m.	101.4	102.9	102.7	101.8	103.2	100	100.7	100.7	103.2	100	100.7	100.7	100.7	100.6			100	
	2 p. m.	101.4	104.6	103.2	101.8	104.2	100.2	101	100.2	104.2	100.2	101	100.8	100.6	100.6			100.6	
	4 "	101	104.6	103.5	103.4	104.2	99.6	100.8	103.4	104.2	99.6	100.8	100.8	100.8	101.9			101.9	
	6 "	101.4	104.1	103.4	103.5	104.2	100.8	100.4	103.5	104.2	100.8	100.4	100.4	100.4	102.4			102.4	
	8 "	101.3	103.4	103.8	103	103	100.8	101.3	103	103	100.8	101.3	100.6	102.8	102.8			102.8	
	10 "		103	103.2	102.8	102.8	100.8	101.4			100.8	101.4		102.4	102.4			102.4	
		Small swelling.	Large swelling.	Slight swelling.	Large swelling.	Large swelling.	Slight swelling.	Slight swelling.	Slight swelling.	Large swelling.	Slight swelling.	Slight swelling.	Slight swelling.	Slight swelling.	Small swelling.			Small swelling.	
Aug. 31	6 a. m.	99.8	100.6	102	101.6	101.6	100	101.2	101.6	101.6	100	101.2	101.2	100.2			100.2		
	1 p. m.	100.7	100.4	102.4	101.6	102.4	100.4	100.8	100.8	102.4	100.4	100.8	100.8	100.7	100.7			100.7	
	6 "	100.4	101.8	101.8	101.6	102.4	100.8	100.6	100.6	102.4	100.8	100.6	100.6	100.6	100.6			100.6	
		After injection	After injection	After injection	After injection	After injection	After injection	After injection	After injection	After injection	After injection	After injection	After injection	After injection	After injection			After injection	

TABLE V.—EXPERIMENTS WITH ALBUMOSE.

I.										II.							
	Date.	No. 20 (farcy) reinjected(5)		No. 21 (farcy) reinjected(4)		No. 23 (glandered) reinjected(3)		No. 11 (healthy) reinjected(5)		No. 17 (healthy) reinjected(3)		No. 20 (farcy) reinjected(6)		No. 21 (farcy) reinjected(5)		No. 23 (glandered) reinjected(4)	
		Time.	Temp.	Time.	Temp.	Time.	Temp.	Time.	Temp.	Time.	Temp.	Time.	Temp.	Time.	Temp.	Time.	Temp.
Before injection	July 11	8 a. m.	101	8 a. m.	100.2	8 a. m.	100.2	July 21	99	6 a. m.	99.4	99.5	100.6	100.6	100.6		
	"	1 p. m.	101.2	1 p. m.	100.6	"	100.4	"	100.7	12 m.	99	100.8	101.5	100.6			
	"	6 "	100.6	"	100.2	"	100.4	"	100.8	5 p. m.	99.8						
When injected			0.005 gm. albumose.		0.005 gm. albumose.		0.005 gm. albumose.		0.005 gm. albumose.		0.002 gm. albumose.		0.002 gm. albumose.		0.002 gm. albumose.		
	July 12	6 a. m.	100	6 a. m.	99.4	6 a. m.	99.5	July 22	100	6 a. m.	99.8	100	100.8				
	"	8 "	100.8	8 "	99.9	"	100.6	"	101.4	8 "	101.4	99.2	100.8				
	"	10 "	101	10 "	100	"	100.8	"	101	10 "	102.6	100.8	102				
	"	12 m.	102	12 m.	101	"	102.6	"	101.4	12 m.	101.8	101	102				
	"	2 p. m.	104	2 p. m.	103.4	"	104.2	"	103	2 p. m.	104.2	102.2	102.6				
	"	4 "	104.4	4 "	104.7	"	104.6	"	103.3	4 "	104.2	102.2	103				
	"	6 "	104.5	6 "	104.5	"	104.8	"	102.8	6 "	104.2	102.8	103.6				
	"	8 "	104.2	8 "	105.8	"	105.2	"	102.8	8 "	104.2	102.8	103.6				
	"	10 "	105	10 "	105.6	"	104.6	"	101.8	10 "	101.5	104.2	102.5	104			
After injection			Swelling.		Swelling.		Swelling.		Slight swelling.		Slight swelling.		Small swelling.		Large swelling.		
	July 13	6 a. m.	103.6	6 a. m.	104	6 a. m.	104	July 23	99.2	6 a. m.	100.8	101.6	102.8				
	"	12 m.	103.8	12 m.	105	"	103.6	"	100.8	"	101.4						
	July 14	6 p. m.	102.5	6 p. m.	104.4	6 p. m.	103.6	"	100.2	"	99.8						
	"	8 a. m.	100.8	8 a. m.	101.4	8 a. m.	102.3	"	100.2	"	100.8						
July 15	4 p. m.	100.6	4 p. m.	102.4	4 p. m.	102.4	"	100.6	"	100.8							
"	7 a. m.	100.2	7 a. m.	100.5	7 a. m.	100.6	"	100.8	"	100							

TABLE V.—EXPERIMENTS WITH ALBMOSE—continued.

II.—Continued.					III.							
	Date.	Time.	No. 26 (glandered) reinfected(2)	No. 24 (healthy) reinfected(2)	No. 30 (healthy)		Date.	Time.	No. 20 (farcy) reinfected(7)	No. 31 (glandered)	No. 29 (healthy)	No. 30 (healthy) reinfected(2)
Before injection	July 21.	6 a. m.	99	99.8	99	}	July 26	6 a. m.	101	101.2	99.5	100.5
	"	12 m.	100.4	99.6	100		"	12 m.	100.6	100.6	101.5	100.6
	"	5 p. m.	102	101	99.5		"	5 p. m.	100	101.8	101.3	101.2
			0.002 grm. albumose.	0.002 grm. albumose.	0.002 grm. albumose.				0.002 grm. albumose.	0.002 grm. albumose.	0.002 grm. albumose.	0.002 grm. albumose.
When injected	July 22	6 a. m.	100	99.2	99.5	}	July 27	6 a. m.	100.5	100.2	101.6	100.6
	"	8 "	100	99.6	99		"	10 "	100.6	100.6	102.8	100.8
	"	10 "	100.8	100	99.4		"	12 m.	100.8	102	103	99.8
	"	12 m.	100.5	99.8	100.2		"	2 p. m.	101.4	103	101	101.5
	"	2 p. m.	100.8	99.8	101		"	4 "	101.8	104	102.8	101.5
	"	4 "	103.2	100	100.5		"	6 "	101.5	104.2	102.4	101.4
	"	6 "	103	99.8	100.6	"	10 "	102	103.8	101.5	101.7	
	"	10 "	103.8	99.4	102.6							
			Large swelling.	No swelling.	Slight swelling.				Small swelling.	Large swelling.	No swelling.	Slight swelling.
After injection	July 23	6 a. m.	101.8	100.1	99.5	}	July 28	6 a. m.	101.2	101.8	100.2	100
	"	"					"	12 m.	102	101.7	101.2	100.2

REPORTS.

REPORT OF THE COMMITTEE ON INTELLIGENCE AND EDUCATION OF THE U. S. V. M. A., FOR THE YEAR ENDING SEPTEMBER, 1892.

"Do not repine, my friends," said Mr. Pecksniff, tenderly, "do not weep for me. It is chronic."

MR. PRESIDENT AND GENTLEMEN: These remarks of Mr. Pecksniff seem to apply to me upon the present occasion; not that I am in the condition that Mr. Pecksniff was in when he uttered them, but it seems as though my chairmanship of this committee were a chronic complaint when I rise to read its report for the third consecutive year. Two years ago I felt like a boarding-house keeper who had a nice roast for her boarders. A year ago, by taking the remnants of the roast and adding a few turnip, carrots, and onions, I felt that I could prepare a tolerably palatable stew; but now I find that I have but a few gristly scraps left wherewith to compound a hash, and if there are a few bare bones left over I fear there is so little upon them that a soup made from them would be very thin and watery; therefore, I pray you that I may hereafter be relieved from the arduous duties of Chairman of the Committee on Intelligence and Education, and a successor appointed with a fresh fund of facts and ideas with which to regale you.

In preparing this report I shall divide it as I did the one last year, first, considering the subject of veterinary education, and after concluding what I have to say upon that question I will briefly call your attention to a few other matters that may prove of general interest to you.

In my communication of last year I called your attention to the fact that while some of our veterinary schools have a three-years' graded course, the curricula of others comprised but two winter sessions of six months, or less, each; but that, in my opinion, the advantages of the longer period of study were to a great extent counter-balanced in many instances by the short-course institutions having a greater number of able veterinarians upon their faculties, with wider experience as teachers, and that about as much instruction as regards the number of

lectures and clinics is crowded into the two winter terms as is spread out over three years in the longer-course institutions. The advantage possessed by the longer period of study is that the student retains the knowledge he acquires slowly, much better than that which is crammed into him in a brief space of time, and that he assimilates the information that he becomes possessed of gradually, much more satisfactorily than that which he receives in a marvellously short while.

Another advantage of the longer course of tuition is that there are certain branches of medical study that cannot be pursued properly unless the pupil has the benefit of laboratory facilities, where he can demonstrate facts for himself, or prepare specimens with his own hands. A chemistry course, for example, which consists of a number of lectures comprising a dazzling and remarkable series of experiments from beginning to end, may be very entertaining and amusing, but is of little benefit as a means of practical instruction, compared to laboratory work, where the student can become familiar with common chemicals, their behavior under ordinary conditions, and a few simple tests for their detection. The same is true of histology, pathological histology and bacteriology. Lectures are not satisfactory, in comparison with work in the laboratory, where the future veterinarian can learn to cut, stain, and mount sections, stain and cultivate germs, and make microscopical examinations of his work for himself. The advantages possessed by the Agricultural Colleges that give veterinary degrees are chiefly in their facilities for laboratory work; and while they may be weak in the means for imparting actual medical and veterinary knowledge, yet they are strong in the scientific branches of instruction; therefore, if their graduates had to hustle for an existence in competition with graduates of regular veterinary schools, they might starve to death, yet we see them fitted to enter the field of original scientific research and acquit themselves with a fair degree of credit, while the regular veterinary graduate has very little conception of how to proceed in this class of work.

At the same time I believe that the veterinary scientist should be a graduate of a school for the exclusive study of veterinary medicine; that he should first be instructed how to hustle for a living as an everyday practitioner, and that then, if his inclination lead his footsteps toward the path of science, he should take a post-graduate course to fit himself for this work.

Instruction at an agricultural college should simply be looked upon as an excellent preparatory training for a veterinary education, and the knowledge of chemistry, care and breeding of animals, physics or microscopy as a great advantage in his future work, but the only degree to be given by these institutions should be B.S., or B.A.S., and should not have any more to do with his acquiring a veterinary degree

than the title of A.B., A.M., or Ph. D., and it seems to me that granting veterinary degrees by colleges of agriculture should not be encouraged by us, and that these institutions are diverging from their proper channels when they do so.

In my last year's report I dwelt at some length on the importance of a higher standard of education for matriculation in our veterinary schools, and that it was, perhaps, as important, or possibly more important, to first secure a reform here, before taking action upon the length of the period of study after entering. In most of our veterinary institutions any pretence of a matriculation examination is a farce, and even in those where they require anything like a high standard of education for admission it is doubtful if it is lived up to, and if it were it would be found that they would have very few students in attendance.

You will doubtless remember that at the Washington meeting, when this portion of the report of the Committee on Intelligence and Education came up for discussion the members present thought it was of much greater moment to attempt to secure a three-years' course in our veterinary colleges, and that the matriculation standard would advance as the requirements of the schools advanced, and that in the future our Association ought only to recognize the graduates of such institutions as require a three-years' graded period of duty.

The result of these deliberations was that the following amendment to our Constitution was offered at the Washington meeting, to be acted upon during our meeting here:

ARTICLE 1. Any applicant for membership shall submit his name upon one of the Association's application blanks, duly vouched for by one or more members of the Association, or by the resident State Secretary for his respective State. He shall be a graduate of a regularly organized veterinary school which shall have a curriculum of at least three years, of six months each, specially devoted to the study of veterinary science, and whose corps of instructors shall contain at least four veterinarians. If of a medical school a similar curriculum as to time shall prevail.

This alteration to go into effect after the annual meeting of 1892. It shall not be retroactive, nor apply to applicants who were college matriculants prior to its passage.

If it be your pleasure, gentlemen, to accept this amendment to the Constitution, I have only to add my hearty Amen!

Some friends of the profession are optimistic enough to hope that some day we may have a national board of examiners to examine the students graduating from all the schools of veterinary medicine in the United States, those passing to be members of the Veterinary College of America, on a plan similar to that governing the M. R. C. V. S. of England to-day. But I fear that if this scheme is even advisable its

adoption is a long way off, and, meantime, I think that the United States Veterinary Medical Association is now in a position to act to a certain extent as censor of Veterinary Medical Education upon this continent. We can certainly put ourselves on record as being in favor of a three-years' graded course of study, at least (with no objection to a longer one), and a matriculation examination sufficient to show that the student has an education that will enable him to profit by the instruction he is to receive. We should only admit to membership men who graduate from schools that meet with our approval, and in this way we can perpetuate this Association as a body of enlightened, learned men, ready to do all in their power for the advancement and welfare of veterinary science, and always striving for the improvement and well-being of a humane and useful profession.

These requirements are now met by the Veterinary Department of McGill University, the University of Pennsylvania, and Harvard University, and the American Veterinary College is about to inaugurate a three-years' course. Its faculty have for some time realized the importance of the change, but until recently the facilities of the school were insufficient to meet this demand. On the other hand, we have an ever-increasing number of the veterinary colleges, pure and simple, with two winter sessions of six months each, and also the veterinary departments of agricultural colleges and State universities, which, while they meet with our views as regards length of course and matriculation requirements, are deficient in the number of their veterinary necessities and the clinical advantages that they are enabled to furnish for their students, and in some instances the means for the acquirement of a knowledge of anatomy by work in the dissecting room is woefully lacking.

The following is a list of the veterinary colleges not already mentioned that are exclusively such. I do not know whether it is complete or not, but any additions or corrections I shall be glad to receive. In Canada there are, besides the Veterinary Department of McGill University, three schools, two of which are French, l'Ecole Veterinaire de Quebec, and l'Ecole Veterinaire Francais de Montreal, a branch of Laval University; the other institution is the Ontario Veterinary College, of Toronto.

In the United States there is the New York College of Veterinary Surgeons, at New York; the Chicago Veterinary College; the Veterinary Department of the Detroit College of Medicine; the Ohio Veterinary College, at Cincinnati; the Iowa Veterinary College, at Des Moines; and the Kansas City Veterinary College.

The following universities grant veterinary degrees: The Veterinary Department of the University of Minnesota; the Iowa State Agricultural College; the Veterinary Department of the Ohio State University; Cornell University; and, possibly, others of which I have no informa-

tion. And, to crown all, while glancing through an agricultural paper the other day I happened to notice the following advertisement:

Farmers' boys, stockmen, farriers, jockeys, you can become skilful horse and cattle doctors, complete and proficient veterinarians, without losing time from your regular employment, by our system of home study. Our course will enable you to earn large fees as veterinary surgeons, or save large sums by treating your own horses or stock. Horsemen, this system will put money in your pockets. For further information and a valuable book, send twenty-five cents (postage stamps) to the American Correspondence School of the Arts and Sciences, Chicago. Mention this paper."

I at once enclosed twenty-five cents in postage stamps to the American Correspondence School of the Arts and Sciences, and in due time received a prospectus of its veterinary department, which I have here for your inspection. If you wish one of these interesting documents, I have no doubt that more are forthcoming upon receipt of the required stamps.

This school, upon the payment of \$25 by the matriculant, furnishes a lecture a month for home study, and also forwards the required text-books upon receiving their price; the books for the first term being: *McFaddean's Anatomy*, *Gould's Medical Dictionary*, *Fleming's Veterinary Obstetrics*, and *Gresswell's Veterinary Pharmacopœia*. The course covers two years, but what text-books are needed for the second year the prospectus does not state. Written examinations are held from time to time. The first year's course can be taken independently of the second year's, but the advanced one cannot be taken first, nor can any student take both in one year. Club rates are offered three or more students living near each other, if desired. Another advantage it possesses is that matriculants can enter at any time. The size and number of "large fees" that the certificate holders of this institution will be enabled to earn as "veterinary surgeons," and the amount of "money that it will put in horsemen's pockets," I leave to your imagination, knowing, as most of you do, the length of time it requires for thoroughly educated veterinarians to build up large and lucrative practices.

This condition of affairs is certainly interesting, and calls for the most careful consideration and investigation upon our part.

If the proposed amendment to the Constitution of this Association be adopted it will be necessary to add a committee on veterinary schools to the standing committees, whose duty it shall be to keep posted upon all matters pertaining to these institutions, such as the establishment of new colleges, the period of study, requirements for admission and graduation, the number and standing of the members of the faculty, and all similar information; or, if it seems wiser to do so, the Committee on Intelligence and Education might perform this duty. It should also

devolve upon the committee having this work on hand to correspond with the proper officials in foreign countries having charge of the management of their respective veterinary schools, keeping them informed upon the standing of our different veterinary colleges, and securing for each the recognition it deserves.

For example, a graduate of an American veterinary college having a two-years' course could formerly enter an English veterinary school, and obtain the M.R.C.V.S. degree in a year, while a graduate of a three-years' school here was obliged to do the same. This is obviously unfair to the man who has taken the longer course, and it is a condition of affairs that we should do our share toward remedying; and we should do all in our power toward securing every facility for our young graduate to pursue his studies in any foreign veterinary school that he may desire to enter, with a due recognition of the course of study that he may have followed at home.

If, however, all the veterinary schools in the United States adopted a three-years' graded course, with a high standard of matriculation examination, I do not think the ideal will have been reached, for I believe that in time, as this country becomes richer, and the veterinary profession older and more advanced, colleges covering a term of four or five years may be established, and many studies of importance that have heretofore been neglected will receive the attention they deserve.

Then, such branches as zoology, zootomy, botany, toxicology, bacteriology, hygiene, and the like, will receive a wider and more thorough consideration than at present. Hygiene is, I think, a very important matter, the veterinarian at present having given but little attention to the construction of stables, ventilation, drainage, the value of fresh air, pure water, proper clothing, careful grooming, and similar questions pertaining to the comfort and health of his charges.

Horseshoeing is another subject that does not receive the attention which it ought to, and instruction should be given in it.

Why could not a series of lessons in horseshoeing be given in some of our veterinary schools for blacksmiths, a certificate to be given to those who passed in it? If those taking such instruction could receive a little more for shoeing horses than the ordinary blacksmith, it might encourage bright and intelligent young mechanics to adopt this trade, and thus give us an improvement upon the extremely ignorant class of men who now follow the business, and also save much equine suffering. I fear, however, that in such an event it might reduce the incomes of some of us! Such a course as I propose should include the anatomy, physiology, and pathology of the horse's limbs and foot, together with proper methods of shoeing, both in health and disease.

Sanitary science and police will then receive a greater amount of attention from the veterinarian's point of view, and in time his value in

connection with boards of health, the inspection of slaughter-houses, provisions and dairies will be more fully realized.

The great obstacle at present to our obtaining from our veterinary schools more severe matriculation rules, longer period of study, more thorough education, more difficult graduation, is the fact that most of them are private undertakings, where personal and pecuniary interests will sometimes overwhelm the most worthy professional and best-intentioned individual. Not until our leading veterinary institutions have ample endowment funds, either as private bequests or public appropriations, will they be enabled to in any degree approach perfection.

Another means of elevating the profession that deserves our consideration is by means of ethics, and I would call your attention to a paper read upon this subject by Dr. A. Liautard, before the Massachusetts Veterinary Association, last May, and published in the *American Veterinary Review*, for June, in which the writer treats the question in a very able and instructive manner, and which I would call to the notice of all who may be interested in the subject. I will, therefore, dismiss this matter in as few words as possible.

It is not to the ethical behavior of our recent graduates that we would call attention, but to the professional morals of the older members of our calling, more particularly that of instructors in veterinary colleges, to whom the youthful practitioner or student is looking for example, and in whose footsteps he is likely to follow.

It is our teachers who are largely responsible for the ethical feeling of the recent members of the profession, and it is their influence and training which have much to do in deciding the professional morals of the young man, whether he looks upon his calling as one of the "learned professions," and feels the proper *esprit de corps* in its well being when launching upon it as his life-work, or, on the other hand, solicits patronage, seeks contract work at low rates, and even goes so far as to claim that the calling of a veterinarian is a business, and not a profession, and that a man to succeed in it in the race for dollars must resort to sharp business tactics in order to get ahead. In speaking of the ethical example set by the instructors in our veterinary schools I do not refer to veterinarians alone, but would include members of what we sometimes style our "sister profession," who are upon the teaching force of all of these institutions, and one of them at least, if not more, take an interest in and encourage proceedings that they would be the first to cry out against, and most loudly denounce, in members of their own profession, evidently considering veterinary so much lower than human medicine that it has no need of any code of ethics at all. Some of these gentlemen certainly have a very curiously perverted moral vision, to say the least, and where it exists it should be corrected.

Last year in this report I made some criticism of the Bureau of

Animal Industry, and since then I have had no reason for changing my mind or retracting anything I said at that time, but the Chief of the Bureau has taken the matter as a personal attack. I, therefore, prefer to make no remarks about it on this occasion, as anything that savors of a personal quarrel has no place in a report of this kind.

Another question that has caused a great deal of discussion lately, and one which I would like to call to your notice, hoping that some day it may be satisfactorily settled, is that of actinomycosis. Is actinomycosis an extremely contagious disease of cattle, spreading with terrible rapidity among our herds, and readily communicated through the beef and dairy products to man, causing countless deaths among the human family, even though the lesions in the offending bovines are purely local, or is it not?

If these various communicable diseases were half as dangerous as we know they are, it would be a wonder that one of us was alive to tell the tale. Meantime, judging from what we see of the two diseases, both in man and cattle, I believe that tuberculosis is vastly more dangerous than actinomycosis, and that it is our duty as sanitarians to do all in our power to abate its ravages, both among our herds and in our own race, and while we should neglect neither malady, tuberculosis is much more urgent, and demands our immediate attention.

Another matter which always interests us at these meetings is the establishment of our U. S. Army Veterinary Corps. We have, as usual, a special committee to inform us upon the subject, and I hope its report may be more encouraging than in the past.

In conclusion, gentlemen, I wish to thank my colleagues upon this committee for the able assistance they have rendered me, and I also wish to take this opportunity of expressing my obligations to my friend and preceptor, Dr. Liautard, for the kindly and useful advice and information he has given me, and to which this report is greatly indebted for much of the value it may have.

Next year we shall have a grand International Veterinary Congress in Chicago, at the time of the nation's celebration of the four hundredth anniversary of the discovery of America by Christopher Columbus. What is a more fitting sentence for me to close with than the words of the immortal Lincoln? Let us meet there, "with malice toward none, with charity to all, with firmness in the right, as God gives us to see the right; let us strive on to finish the work we are in?"

DISCUSSION.

Dr. SALMON: I have been waiting for some one else to say something on this report, and I rise to say that in general the report is one which shows that labor has been bestowed in its preparation, the consequences of which are worthy of every commendation. If it had not been for one sentence in it I should have had nothing to say in disparagement of it or the gentlemen who presented it. It seems to me, however, rather extraordinary that the Chairman of the committee has taken occasion at this meeting to reaffirm everything that was said in the report of his committee—or rather, as I take it, in his personal report which was presented at the Washington meeting. So far as that report confined itself to a discussion of scientific questions, I shall say nothing at this time, because I treat of the scientific questions in a paper which I shall read to-morrow; but there were in it certain personalities painful to me, painful, I should think, to every member of this Association who believes in justice and fair treatment of our members. Those personalities attack the honesty and truthfulness of members of this association contributing to the scientific reports of the Bureau of Animal Industry. Now, I want to say—I cannot avoid saying—that so far as I know, and so far as I believe, the reflections upon the honesty and truthfulness of the gentlemen who have been engaged in the scientific work of the Bureau of Animal Industry, and I include myself in the number, are absolutely false, and had no reason for their being presented before this Association. It seems to me, Mr. President, that if any member of this Association desires to attack the character of any of our members, or to prefer charges of that nature, they ought to have been brought, as charges of that kind have been in the past, before the Comitia Minora, with exact specifications as to the evidence upon which they were made, for investigation, and in case they were proved to be truthful, then the members who had so offended against science and against the Association to which they belong should have either been given an opportunity of resigning from the Association or be expelled. If the charges were not true, they could have been dismissed without being spread broadcast to the world. I do not know that those charges effect me very much, or that there is anything I am striving for that I cannot get. Such allusions, made in an official report applied to a young man with a reputation to make, and a character to sustain, might wholly blast his prospects in life. I am free to say that although I had always had the highest respect for the gentleman who presented the report, I can never feel toward him again as I did in the past, nor do I believe that any member of the Association who had such charges made against him would ever

forget and forgive them. Another thing, I have always taken pride in feeling that the members of this Association were above attacking the reputation, and truthfulness, and honesty of gentlemen in discussion, and I thought there would be a disclaimer of any idea of making such charges as these, but I am surprised that such has not been given, and that every statement entertained in that report has been reaffirmed and the opinion positively expressed that the author still holds to all the statements therein made.

COMMITTEE ON ARMY LEGISLATION.

To the President and Members of the United States Veterinary Medical Association.

GENTLEMEN: Your Committee on Army Legislation respectfully submit the following report:

As soon as practicable after notification by your Secretary of our appointment a conference was held in the office of Dr. C. B. Michener, in Washington, D. C. The chairman of the committee reported that he had visited the House of Representatives on the afternoon and evening of the preceding day, and had met the committee of the House known as the Committee on Military Affairs, which has charge of all such bills. From them he received positive information to the effect that it was useless to attempt to pass any bill through Congress at that time that had not the unanimous indorsement of the veterinary profession throughout the whole country. Another objection, and one which was very prominent, was the opposition to an increase in the number of commissioned officers of the army, especially in the medical department; and last, but not least, came the statement that there was no immediate necessity for the passage of any bill at this time, as the veterinarians already employed in the service seemed to fulfil all the demands necessary at the present time. After mature deliberation your committee were unanimous in the opinion that the only bill we could hope to pass was the one introduced by Mr. John L. Jolley, of South Dakota, and known as H. R. Bill No. 5991. This bill had been before the House at the last session of Congress, and had been referred to the proper committee and held by them without any further action, for various reasons, but principally because of the opposition of some of the profession who did not think non-graduates or graduates already in the army should be allowed to be retained in the service unless they should again come in the same way and manner as new applicants, while those already in the service and their friends claimed that they should have preference shown them, or be allowed to remain in the service without further examination. For this reason, together with other objections before mentioned, nothing had been done with the bill.

Your committee made two or three subsequent visitations to the House, and had interviews with such members of Congress as they knew or could influence to assist them, and did whatever they could

to secure the proper legislation, but failed in each and every effort to accomplish any favorable results. Furthermore, we found it impossible to push the work assigned us without incurring considerable expense, and having no fund allotted us from which to draw to defray such expenses as would seem to be absolutely necessary and legitimate, and as the close of the session was near at hand, and sufficient time could not be had to correspond with veterinarians throughout the country and get their indorsement of the bill and such influence with the representatives from their respective districts as would secure, if possible, the vote of each on the final passage of the same, we came to the conclusion that further efforts would be fruitless, and decided to abandon the work and save further expense.

Your committee would respectfully recommend that a new committee be at once appointed by the incoming President, with power to draft a new bill or revise the old one, eradicating the objectionable features, so as to make it acceptable to all, if possible; and that a number of copies of the same be printed in circular form, sufficient to furnish every reputable veterinarian and member of this Association throughout the country with a copy, and that they be sent to the different State Secretaries by the Secretary of this Association, or by the committee themselves, with a request that they forward the same to all veterinarians known to them in their respective States, and secure from them, if possible, the indorsement of the same, and that each individual veterinarian, should the bill be acceptable to him, be urged to use his influence with his Representative in Congress in securing his vote in favor of the bill.

We would also recommend immediate action in the matter by the newly appointed committee, and that a copy be sent especially to the Secretary of War, and the justice and merits of the proposed bill be made known to him personally, with the hope that he may be influenced enough to refer to and present the matter with his annual report to Congress at the beginning of the next session. This course was suggested to the chairman of your committee by one of the members of the Congressional committee during one of the conferences held with them during the last session. Its desirability can readily be appreciated.

We would further recommend that the committee be authorized to draw upon the Treasurer of this Association to defray the expenses of printing and mailing said circulars and such other legitimate expenses as may be absolutely necessary in the prosecution of the work.

Respectfully submitted,

WM. B. E. MILLER, D.V.S.,
C. B. MICHENER,
F. L. KILBORNE,

Committee.

A BILL TO FIX THE PAY AND ALLOWANCES OF THE VETERINARIANS
OF THE ARMY OF THE UNITED STATES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the pay of the veterinarians of the Army of the United States shall be one hundred and twenty-five dollars per month, with all the allowances of a second lieutenant of cavalry.

SEC. 2. That the number of veterinarians of the Army of the United States shall not exceed two for each regiment of cavalry.

SEC. 3. That hereafter all appointments as veterinarians in the army of the United States shall be confined to graduates of recognized veterinary colleges of the United States, and candidates for such appointments shall be citizens of the United States and shall be required to pass such examination as the Secretary of War shall direct.

SEC. 4. That all veterinarians employed as such in the Army of the United States at the passage of this act shall be immediately reappointed without examination under the provisions of this act.

SEC. 5. That this act shall be in force and effect from and after its passage and approval.

PUBLICATION COMMITTEE.

MR. PRESIDENT AND GENTLEMEN: As chairman of your Publication Committee, in offering you this brief report, it comes with an apology that you have not enjoyed the past year a complete reprint of our proceedings at Washington, as you did of the one at Chicago. The unfortunate condition you left matters in at Washington, when appealed to to leave the whole matter of this work in the hands of your committee, which went unheeded, ended just as might be expected—in untold chaos, unending dissatisfaction, and from that time to this there has never been at any one time in your committee's hands the entire list of papers, reports, etc., that were read and considered there. Until some three months ago I was only able to get together the large part of this matter, and a publisher's estimate of the cost at that late day of about \$250 for 500 copies seemed an unwise expenditure at this time. On the various pretexts and claims one paper and another were taken away, or failed to be placed in my keeping, so that only a part of our proceedings has ever been published.

For your and my good I beg of you to so clothe your Publication Committee with such control of all your proceedings, which become your property the moment they are offered for consideration before your meetings, and all corrections, changes, etc., must be made from proof copies, if demanded by the writer; and in this way you can be assured of a complete and prompt issue of your journal of proceedings. I would suggest for your consideration the wisdom of combining this and last year's report under one cover, together with a complete list of all the officers and members since your organization. Allow this only to members and applicants, to all others desiring a copy at the exact cost for printing.

We issued, one year ago, 1000 programmes for our meeting; for the present gathering some 1750 were printed, and of this number 1600 have been sent out through the mail.

Some 500 lists of officers and committees were issued after our Washington meeting, and on January 1st, of this year, 500 copies of our lists of officers, committees, and members were printed for our use. A copy of each one of these was sent to each member.

During the year I purchased 250 copies of the October and November issues of the *Comparative Journal*. To each member not a *Journal* sub-

scriber I sent an October number, which contained the stenographer's report. The others were judiciously distributed, and have brought us a rich return in new applicants and revived interest in our society.

Some 350 copies of the lists of applicants have been issued, and though they only were placed in the printer's hands on the 15th, I have found opportunities of sending out nearly one hundred, particularly to those who did not expect to be with us, that they might scrutinize the list and forward any objections that they deem best for the welfare of our Association. Our 1000 application blanks are exhausted, and will require renewing after this meeting. They might be changed to advantage by printing thereon our rules and By-laws relating to the qualifications of applicants.

The list of veterinarians which I had compiled one year ago, numbering at that time some 1300, has now reached about 2100, scattered over our entire country, and can be carried to about 3000 if time would only permit. Most of these names and addresses have been in some way or another verified during the past year, and will be of great service during the coming year in measuring our plans and completing the same for our international meeting. They have been arranged alphabetically, and, as far as possible, their college parent investigated. This year it was of great service in aiding the work of assistant secretaries by furnishing lists of the members of the profession in their respective States. If our now 350 members would resolve themselves into committees of one, we can, in less than three months, make a complete canvass of the members of the profession throughout our whole country.

The expenses of this committee during the coming year will be extraordinary, and I am not sure but what, in view of these and a large increase in every other direction, that it would be wise to so clothe your Comitia Minora with power to devise ways and means for providing money through our membership to cancel the same. We cannot afford, in view of the international character of our next meeting, to limit or restrict the great good it promises for our profession on the grounds of lack of pecuniary means. With some \$750 in the treasury, and a careful estimate of our income during the year, we will have about \$2000 at our disposal.

It became necessary to procure an issue of our certificates during the year, and I procured 200 copies, which, at the rate new applicants are seeking admission, will only last another year.

Many minor matters were placed in print during the past year, and some mimeograph work was utilized, all tending to increase our usefulness and promote the welfare of our organization.

Respectfully submitted,

W. HORACE HOSKINS,

Chairman.

SECRETARY'S REPORT.

MR. PRESIDENT AND GENTLEMEN: I find great pleasure in briefly calling your attention to the work of this office for the past year. It surely has been one fruitful of results, and must give us grave thoughts in considering the future of this organization. The promptness of our new members in completing all the requirements for membership has been very commendable, and at no time in our Association's history has the general financial standing of our members been so good as now. On January 1, 1892, with a total membership of 264, there was only due for initiation fees and dues the sum of \$638; while at the same time in 1890, with a total membership of 269, there was \$1071.50 due. On September 1, 1892, with a total membership of 262, there was due, including this year's dues, \$997, since when \$115, September 12th, \$187, September 17th, has been paid in. Less than 20 per cent. of our membership owe two or more years' dues, and of this number a great proportion only await an opportunity like to-day to make good their dereliction. But twenty-three members still remain unqualified on September 12th, and this number has been reduced to-day, which is a high encomium on the class of men we are adding to our organization. This meeting dates the end of those who have had in the past an opportunity to raise the point that they had not given anyone authority for submitting their names, and to our future secretaries this will be a keen relief from the provoking criticism and ungentlemanly and unprofessional epistles which it has been my lot to receive during my incumbency of this office. The adoption of our application blank has changed all this, and it has already proven a tower of strength to our Association. It is a record that neither time nor uncertain memories can wipe out, and only misfortune or death will be among the future causes for failure to complete their qualifications on the part of applicants; carelessness and unfaithfulness in caring for the great responsibilities on our shoulders on the Association's part.

In three short years over 200 applicants have knocked at your doors for admission—more new members than the total membership was in 1888. From an application list of 14 at our New York meeting, in 1888, we have to-day, for 1892, the enormous number of 106—more than one-third of our entire membership. From an attendance in 1888 of about 40, we have had at Chicago and Washington over 100. In

1888 we had but 22 members west of the Allegheny Mountains, 50 per cent. of whom were at that time in bad standing. In 1891 we had in the same territory 88 members, with less than 20 per cent. in arrears; and to-day, September 12th, from that same territory, 28; September 17th, 36 are asking favorable consideration at your hands. The closer the scrutiny, the more exacting the conditions, the stronger the restrictions, the better and greater the number who desire and prize the honor of your fellowship. Surely it becomes our bounden duty to add every wise restriction to our membership, and demand the broadest qualifications for our future members, lest our phenomenal growth may be a weakness rather than a strength. I want to say for our list of applicants of to-day that they are the best we have ever had, and from Maine to California, Washington to Washington, they are selected from the most aggressive and zealous members in their respective States that are in the profession to-day, and we will thus add more real strength to our Association now than we have added in any five years of our history.

From a single day's meeting we have increased our work until triple that time will not permit of our giving proper consideration to the important business and papers that are ours for consideration in the interests and welfare of our profession in this country. From a total yearly expense, with two meetings, of \$100, it has required for the past year almost \$700, every dollar of which has been carefully spent in promoting your growth and caring for your interests, and I can readily see where much more might be well spent and a rich return gathered for the outlay. Not a single instruction on your part has been left uncompleted during the past year. Every member of every committee has had due notice of his appointment, and every notice to all the members has been promptly given, with your decisions and instructions, so that any and all of your actions to-day cannot be questioned or criticised in the light of lack of knowledge of what might be expected.

As an organization we are in thorough condition, so far as our members are concerned, for the performance of all and every duty that may be demanded to make our international meeting a grand success. It only remains for your officers and committees to complete the plans of action, and they will be carried into effect with efficiency and promptness by our members unexampled in our Association's history. During this whole year I have kept prominently in view our meeting for "'93," and already in several States are working committees formed planning for the coming year. State and local organizations have been kept informed of all our movements, and in turn have secured for us support and aid that in many ways have added to the success and importance of this meeting. From our Assistant State Secretaries I have had this year the most helpful support and aid, and I want to give here public approval and sincere thanks for their efforts, which have been so highly

appreciated on my part in the performance of the duties of this office. Through them we have been kept in close communication with all our members and every kindred organization throughout our land, and the extent of their usefulness in the future may be best measured by a well-deserved reference to what has been accomplished by the untiring efforts of our Assistant Secretary for New Jersey. Besides keeping supervision of our membership in his State, aiding every effort to give prominence and import to our organization, he has appointed, with the approval of your officers, a working committee for this meeting, and placed before you for consideration no less than twenty-four applicants for membership. It simply required my notice to him that we were not gathering in his State as much strength as the growth of the profession warranted, and you can best judge of the results attained. This work of his must highly command your warm approval, and he has set a strong example for future State Secretaries, which I am sure will bear richer fruit than we have ever garnered. It means for us the consideration of at least 200 new members at Chicago, and strong work in every direction that will give us all cause for great rejoicing in the success and scope of the work of our organization.

Not a single communication reaching my office during the past year has gone unnoticed, and, while there was held out the promise one year ago that there would be less to do this year just closed, my experience has been to find that the work has quadrupled, and for the past ten weeks has demanded from four to six hours daily of my own time, and consumed the whole day and many evenings of a clerk for the same period. The coming year will be one of unending work, if we are to have at Chicago such a meeting as justly befits our wonderfully progressive nation, and there will be a strong demand on the individual members to do some part of this work.

It has been a source of pride during the past year to find that many of the papers read before this Association at Washington have been copied and published by foreign veterinary journals, as well as comments and selections from our committee reports, and we are surely but almost unconsciously creating an American veterinary literature of great value and worth to the whole veterinary world.

I want to thank here all those who have contributed to the better performance of the work of this office, and to thank you all for the generous treatment and confidence you have reposed in my work as your Secretary.

W. HORACE HOSKINS,
Secretary.

REPORT OF THE SPECIAL COMMITTEE ON FOOD INSPECTION.

BY O. SCHWARTZKOPFF AND W. BRYDEN.

GENTLEMEN: In looking over the veterinary and medical journals and the daily press of the country during the last year, it must have become apparent to any one that a great change in sentiment has taken place in regard to meat and milk inspection, not only in professional medical men, but also in the great public. A few years ago the matter was hardly discussed anywhere, whereas, to-day, it is an important issue in many States and cities, and its practical application is more or less considered all over the country. Still, the practical side of the question is yet almost entirely neglected. Judging from some occurrences of the last year, much patience and prudence will be required by veterinarians and other experts in properly establishing this branch of sanitary science as needed.

The first matter I shall have to explain before the Association is the dispute which has arisen between Dr. W. L. Williams, of Indiana, and myself on actinomycosis bovis in its relation to meat inspection. Dr. Williams, as chairman of the committee for 1891, brought forth a lengthy report at the last meeting in Washington, in which he severely criticised portions of my original paper on national and international meat inspection, especially the stand I had taken on actinomycosis. I claimed at the time that meat from cattle so diseased might be fit for human food in parts, according to examination, giving no reasons for such position, because the character of my paper did not permit me to do so. Dr. Williams, in his report, took the opposite stand, arguing that actinomycosis is a contagious disease, and the meat dangerous as food; he explained his position at length, intermixing it freely with a goodly supply of unfriendly compliments for me. I should have been glad to have the matter lie over until to-day, as Dr. Williams thinks I ought to have done; but the great timely interest attached to the question, together with his peculiar, aggressive style, compelled me to reply to his report before this meeting in our professional journals.

In this reply I confined myself to compiling facts, which went to show that actinomycosis cannot be considered a contagious disease, and that the meat of animals affected with a localized actinomycotic tumor is looked upon as innocuous by our authorities on actinomycosis. To this,

again, Dr. Williams replied in our veterinary journals, trying hard, theoretically and inferentially, to sustain his views of the contagious character of the disease. I gladly admit that some of his arguments are forcible, and have made me still more cautious than I naturally am; but the general strain of his ideas is without scientific accuracy, and seems to indicate that he is gradually shifting around to another view. This, at least, may be inferred from the conclusion of his latest article, which reads about as follows: "It seems that Dr. Schwartzkopff would have the reader believe that the committee held in the report that actinomycosis was highly contagious; that it was generally due in animals to transmission from animal to animal; that it could readily be transmitted from animal to animal or to man; and that the destruction of the meat from animals mildly affected was an advisable sanitary measure. A careful reading of the text of the report will clearly show that these inferences have no foundation." I am unable to extract any other view out of the general tenor of Dr. Williams's articles than the one mentioned, and take this utterance for an unconscious retreat. But I hope that he will soon become conscious of the fact that he has been fighting on the wrong side—not more for his own sake than for the conversion of those American veterinarians who, less gifted and learned than he, have been blind followers of his views.

In the meantime I shall continue to sustain my standpoint on actinomycosis, and I take pleasure in reading to you a letter from Prof. Mayo, of the Kansas Agricultural College and Experimental Station, which he kindly consents to have embodied in my report. He quotes under date of August 24th:

"PROF. SCHWARTZKOPFF, Minneapolis, Minn.

"DEAR SIR: Pursuant to mine of the 22d, I send you a brief report of my work upon actinomycosis bovis, or that part of it relating more particularly to meat inspection.

"I have been at work at this disease during the past three years, and the more work I do with this disease the more firmly am I convinced that the essential part of the life-history of the organism is yet to be worked out, inspectors and others to the contrary notwithstanding.

"In many autopsies held upon 'lump-jaws,' where specimens have been collected and examined microscopically, I have never found an animal affected in any other place, unless purposely inoculated, than evident upon an ocular examination. The little fibrous tumors found along the intestines and in the mesentery (See *Report of the Illinois Live Stock Commissioners*, 1890, p. 17) are not antinomycotic in nature, and have nothing to do with the disease.

"Of fifty inoculations made upon animals thirty-eight were made with pus—most of it taken directly from a cavity and transferred to

the point of inoculation immediately before it could be coated to any extent; a few were inoculated with pus allowed to dry from two hours to two weeks. I have used it in sufficient quantities to form an abscess. I have also produced an abscess artificially and inoculated it with fresh actinomycotic pus. I have inoculated in the tongue, jaw, neck, shoulders, etc. I have fed animals oats soaked in warm water in which a large amount of pus had been stirred, first wounding the tongue or mucous membrane of the jaws and cheek. All of the thirty-eight inoculations were *total failures*.

"Of twelve inoculations made of a neoplastic growth which formed after an operation on an actinomycotic tumor, five were successful; yet I can hardly call it an inoculation; it is a transplanting.

"I have also tried growing the organism on agar-agar, plain and nutrient, on gelatin, bouillon, and blood-serum, surface cultures and anerobic—at room temperature and in the incubator; and though the organism will remain intact and of normal appearance for months, yet upon a careful examination I have failed to discover any growth of the organism itself.

"I do not think this disease can be conveyed from one animal to another except by direct transplantation, and I am of the opinion that we must look for the source of the infection outside of the animal body. I do not think the animal economy is a natural place of abode of this parasite, and the conditions in the animal economy are not sufficiently favorable for the organism to mature its spores to a stage where they will germinate under favorable conditions; hence the 'rosettes' as found in the pus are harmless, because incapable of growth.

"I consider the flesh of actinomycotic animals as perfectly harmless as food. I am of the opinion that they ought to be condemned only when general emaciation indicates malnutrition; not because they are affected with actinomycosis.

"These opinions have been formed as the result of my own work. When I commenced work, through the influence of my former teachers, I considered it a 'dangerous contagious' disease, and the flesh as unfit for food.

"I am firm in my opinion, but not rabid, and am open to conviction to a contrary opinion, when careful and truthful work shall bring forward evidence that does not now exist, which will show this disease to be of a dangerous contagious nature. . . . "Yours, etc."

I lay a good deal of weight upon this letter, because the observations come from an American veterinarian who has worked independent of foreign investigators, and who was under the influence of adverse teaching. Other investigations about actinomycosis have been made by Profs. Max Wolf and James Israel, published in *Virchow's Archiv*, vol. cxxvi. 1.

They report the successful cultivation and inoculation of actinomycosis which were taken from two cases of human actinomycosis. They succeeded in cultivating it on agar-agar at 37° Celsius and under anerobic conditions. The microscopical examination of these pure cultures showed micro-organisms of very different form and size: short and long rods which were solid or jointed; filaments, with and without bifurcation; some of spiral form, others resembling cocci. The club form, so characteristic of actinomycosis bovis, did not appear in the cultures. From these results the investigators classify the micro-organisms with the bacteria. Intraperitoneal inoculation on eighteen rabbits and three guinea-pigs, four with pure cultures, resulted in producing tumors of the size of a bean or hazelnut in which the clubs could be found. The inoculation of one sheep had a negative result; experiments with calves or cows were not made.

Still another discovery of interest is reported in the *Lancet* of July 2, 1892. As early as 1886 Dr. Vandyke Carter suggested the identity of the Indian disease commonly known as Madura foot with the European form of human actinomycosis. Recently Prof. Crookshank received a specimen of Madura foot, and Mr. Hewlett, under his direction, examined it by the modern methods used for actinomycosis, and reports as follows: The disease occupied the whole of the foot and the lower third of the leg. The foot was enlarged, the bones softened, and small abscess cavities were scattered through the tissues and communicated with the surface, the external openings of which had raised and thickened margins. Specimens of these were stained by Gram's method, and showed a fine network of branching and interlacing filaments stained blue, but the club-shaped bodies were apparently absent. By staining with orange-rubin, however, clubs can be demonstrated at the periphery. The microscopical appearances of Madura disease, both in the stained and unstained conditions, are identical with those of actinomycosis; clinically and pathologically, also, the diseases resemble each other closely, and there can no longer be any doubt in pronouncing Madura foot a manifestation of actinomycosis in man.

As nothing is said in Mr. Hewlett's report about the etiology and symptoms, and as the disease was unknown to me, I consulted *The Reference Handbook of the Medical Sciences*, by C. Buck, M.D., where the following is said: "The disease is always protracted in duration—four, six, or even twenty years may elapse before the foot becomes so entirely disorganized as to demand an amputation. The affected foot may, in some cases, exceed its fellow four or five times in bulk, and obtain a weight of a dozen pounds or more. . . . The origin of the disease is commonly attributed to the entrance of a thorn or splinter or to a bruise inflicted upon the part. . . . No one in India, therefore, has ever pronounced the disease contagious."

The curative treatment of actinomycosis has been generally confined to surgical measures and to the application of iodine, carbolic acid, caustics, etc. In this way starting tumors have readily yielded to treatment, whereas tumors already affecting the bones and actinomycotic glassitis were looked upon as hopeless cases. The news, therefore, will be welcomed that Prof. Thomassen, of the Utrecht Veterinary School, pronounces iodide of potassium as a specific in every form of the disease when given as a drug. Prof. Nocard, at a recent meeting of the Paris Central Veterinary Society, in giving an instructive account of the disease, fully sustains this report from his own experiments. He gives the drug daily in doses of six grammes (about three and one-half drachms) in a pint of water until signs of iodism appear or until improvement commences, which may be usually expected within eight days. Then the dose is reduced to five or four grammes (about two and one-half drachms). The animals endure this treatment well, and in less than eight days can masticate hay. From eighty cases a cure has generally been effected, and, on an average, in fifteen days.

To my mind the discovery of our esteemed French and Holland colleagues is very valuable, and more scientific and humane than the advice of the Illinois Live Stock Commission and some teachers of the Chicago Veterinary College, viz.: "The wholesale condemnation and destruction of cattle so diseased;" or—not to forget—the pledge of the members of the Northeastern Iowa Veterinary Society, "To discountenance the removal of actinomycotic tumors, . . . thereby enabling the owner of such animals to dispose of them to unsuspecting parties."

Turning now to a short consideration of the practical application of meat inspection in this country, I am glad to report that a number of large cities have established Bureaus of Meat Inspection, employing one or several veterinarians as meat inspectors, instead of the old custom of employing butchers, or, what is still worse, political impostors. However, that such a desirable institution is not always easily and quietly obtained was shown by the recent struggle in Buffalo, N. Y. The Health Commissioner of that city is a progressive man, and was of the opinion that the office of cattle inspector should be filled by a well educated and practically informed veterinary surgeon. Under the civil service law, however, he is required to confine his appointments to such applicants as are certified to be competent by the examining committee. Here it transpired—incredible as it may seem—that from three veterinarians and two butchers, which formed the eligible list, a butcher came out at the head of the ticket with 90 per cent., and marked "veteran." To this the Health Commissioner objected, as, in his opinion, the butcher's paper could only be marked 45 per cent., although he admitted that the veterinarian was also marked too high.

Judging from the newspaper slips which were forwarded to me, the controversy must have been warm and interesting, some Civil Service Commissioners maintaining the view that a butcher was as competent for the position as a graduate of a veterinary college; and in regard to bad spelling and incorrect use of technical words, they said, it was shown by the examination that none of the veterinarians could have passed a satisfactory examination.

I must confess that the answers of one veterinarian, as printed in full in the *Buffalo Courier*, were amazing in regard to illiteracy and lack of professional knowledge. I am really ashamed to reproduce them before this Association, and do not wish to dwell any longer on the subject, except to say that if such public examples should become common they will reflect badly on our veterinary colleges. The outcome of the contest in Buffalo was, I understand, a new examination and the ultimate employment of a veterinary surgeon.

The condition of meat inspection in Europe cannot be uniformly judged, as there is too great a variance in different countries. England, generally speaking, seems to be not better off than our own country, while it cannot boast a national law, as we now have in effective operation in regard to international inspection. Austria, Spain, and Russia have made little attempts at inspection, although St. Petersburg has a very fine public abattoir, which possesses the only museum for meat inspection in existence. Germany, France, and Italy, however, are undoubtedly those countries where meat inspection is most highly developed, and the new national law of Italy, enacted a year or two ago, is considered by many the most perfect inspection law in enforcement. I have been unable to collect facts about meat inspection from France and Italy, but I wish to report some interesting data from Germany, gathered from some of her veterinary journals.

Prof. Hirschberg, of Berlin, announced before the Berlin Medical Society that he had examined within the sixteen years between 1869 and 1885 60,000 people with diseases of the eye, of which seventy cases were traced to the lodgment of a cysticercus within the eye. During the last six years he had examined 46,000 people, and he has found the parasite only in two cases, of which one was from Saxony. He says that this fact cannot be merely incidental, but must be looked upon as a triumph of meat inspection at Berlin. Prof. Virchow sustained this view from the observations in his clinic in regard to cysticerci in the brain. The proportion of 1:31 had lessened within the last eight years to 1:280.

But even the domestic dog seems to benefit by the meat inspection in Berlin. Dr. Deffke, in his article on "The Entozoa of the Dog," states that animal parasites of the dog have been greatly diminished in Berlin. The older sick reports of the Berlin veterinary hospitals show

that the treatment of *tæniæ* has been quite common, whereas it is rather seldom at present. The *tænia marginata* of the dog, for instance, from which the *cysticercus tenuicellus* of slaughter animals develops, was found by Deffke only in 7 per cent. of post-mortem examinations, while Schöne, in Saxony, found them in 27 per cent., and Krabbe, in Iceland, in 75 per cent.

Since game is included in the meat inspection in Germany a wild boar at Berlin has been found diseased with *trichinæ*, and several species of river fishes have been found to be affected with *cysticerci* of the meat. The so-called *actinomyces musculorum suis*, discovered by Dunker, has also been found by him in the muscles of sheep; the meat from such animals has a watery appearance.

An invention of great importance for public slaughter-houses evidently is the Kafill disinfecter. The original apparatus was invented by De la Croix, a veterinarian, at Antwerp, but it has undergone some improvements. This apparatus is now in use in many abattoirs in Germany, Holland, Belgium, etc., and is highly recommended as a substitute for rendering tanks or other apparatus employed for the destruction and utilization of condemned carcasses. It consists of a sterilizing and drying apparatus of large dimensions, reducing animal matter into fat, glue, and fertilizers. This disinfecter works now to perfection and absolutely without any bad odor, which seems to be unavoidable in the use of crematories.

Another apparatus of interest is that of Rohrbeck, with which experiments have been made at the Berlin abattoir. It is also a sterilizing apparatus, but not for the destruction but the preservation of meat. In this apparatus large pieces of meat can be heated to a degree which not only destroys all animal parasites, but also all kinds of bacteria and germs of organic nature, without reducing the nutritive value of meat or altering its natural taste. Should the question be settled that meat so prepared can be safely sold for food, the disinfecter of Rohrbeck would soon be in general use at the public abattoirs in Europe.

Whether milk inspection is really anywhere properly enforced in this country I have been unable to find out in time for this report. The States of Massachusetts, New York, New Jersey, New Hampshire, Pennsylvania, Connecticut, Ohio, Indiana, Wisconsin, Minnesota, and Iowa have so-called dairy and food commissions, and many other States have dairy and food laws that are enforced by the Boards of Health of those States. In addressing the Dairy Commissioners and Secretaries of States I have secured a number of reports which are interesting reading matter for a veterinarian. But a glance at them shows that they are established on a commercial basis, for the assistance and enlightenment of farmers and dairymen. The chemist is the only professional man whose work is called for by these commissions; he fills the pages

of the reports with analyses of milks, and gives useful instruction as to the best methods for butter and cheese factories. It is certainly important that we consume milk, butter, and cheese, the composition of which is natural and pure, and we should not underrate the services of chemists in such places as hygienists. But it is equally true that a chemical analysis of milk does not reveal the presence of tubercle bacilli or other germs with which milk is so abundantly infected, constituting, as is well known, by far the gravest danger to the human consumer. We must go back to the stables and cows that produce such milk, and here, as well as in the laboratory, comes in the value of the veterinarian. This fact is apparently not sufficiently appreciated by the Dairy Commissions, or they have not seen fit as yet—from political reasons—to include the services of a veterinarian in this work. Occasionally I find a report from so-called inspectors about the hygienic condition of stables and dairy stock, but these reports give evidence that they cannot possibly come from a qualified veterinarian, although some are signed V.S.

I think we should give the matter of milk inspection our earnest consideration; for there is a great field of research before us, and a most valuable public service in another direction of hygiene. Attempts should soon be made to secure such positions on the staff of these Dairy and Food Commissions, and make them what they ought to be, and another upward step will be taken by the veterinary profession of this country.

DISCUSSION.

Dr. WILLIAMS: I was not a little interested in Prof. Schwartzkopff's report, and find very little in it to which I can take any exception whatever. Still it is necessary that some one should speak in order to have a discussion. There were a few statements made that I think we can well afford to pay some attention to. In his report regarding the State Board of Live Stock Commissioners of Illinois he makes the statement that the tumors in the intestinal and lymphatic glands were of a fibrous character. According to my recollection (unfortunately I have not the report at hand), this statement of the Live Stock Commissioners of Illinois was based upon microscopical examinations made by men in whom we should repose at least some degree of confidence. How liable they were to error I cannot, of course, state; but for my part, although not interested in the matter directly, I think we should accept those statements. He also, in his report, would lead this Association to infer that pure cultures of this micro-organism are not practicable, and quotes

several authorities on this point. We certainly have the reports of several good authorities who assert that they have cultivated actinomyces, and you have heard what Dr. Billings has also asserted, that he can cultivate them without trouble.

Then, again, in the article which Dr. Schwartzkopff, quoted by James Wolf, in Berlin (unfortunately I have not been able to obtain a copy of it), he seems to desire to lead this Association to infer that they, too, had failed. Unfortunately, I am not well acquainted with the German language, but I have in the "*Oesterreichische Monatsschrift für Thierheilkunde*" a quotation from the *German Medical Times*, published at Berlin, which is taken from the report of Wolf and Israel, in which they said that Israel and Wolf did succeed in cultivating these germs; and that although they were of various forms, and not in the majority of cases identical, morphologically, with the germ as found ordinarily in the actinomycotic tumor, yet was sufficiently characteristic as to leave no doubt as to their nature, that they were the real cause of actinomyces.

Again, in regard to the contagiousness of the disease, he quotes largely from Dr. Mayo, of Kansas. But they fail to state that Dr. Mayo obtained his first information from Schwartzkopff himself, upon whose authority the statement is based; and that gentleman's education is of the highest order. I shall not deny the statement, but I think that this is rather poor ground to take for a man's competency, that is, if he were so educated that he was, apparently, under the necessity of accepting the views of another man. Then, quoting again from Wolf and Israel, he apparently would lead us to infer that they did not succeed in transmitting actinomycosis. As I read the extract, which I have, they certainly did transmit the disease to twenty-one out of twenty-two experimental animals, and gave their word for it, and have found actinomyces in the tumors examined. Now, if I am wrong in my reading, Mr. Chairman, of course I shall have to stand corrected; but I think that these gentlemen gave very clear evidence.

Dr. SCHWARTZKOPFF: Mr. President—I am very glad to see that Dr. Williams is gradually shifting round to a view that comes very near to mine on the question of actinomyces, of course, in a very slow way. As to the first quotation regarding the tumors, on the part of the Illinois Live Stock Commission, I make this quotation from Dr. Mayo. Then, as to the obtaining of pure actinomyces cultures, the only thing I wish to draw the Association's attention to is that these labors of Wolf and Israel are in no wise an experiment. Neither of these workers pretended to prove that from the experiments with rabbits and other small animals that they have solved the whole question of actinomyces. I hope, Dr. Williams, that within another year you will reach such conclusions you will not insist on actinomycosis as a dangerous disease. I

have come into this question, as a participator in the discussion, against my expectation and desire. I have no desire to get my name in the stream of discussion, but as it has gone in, I want to stand to my views. The cause of the discussion of this question arose from the wholesale condemnation of meat on account of simple actinomyces tumors. When I went there I was called upon by the cattle inspector to decide on a quarrel which they had had with some shepherds. The cattle looked very healthy. I had no official position at all, but when I found that all over the Western country it was their habit to condemn these cattle I thought it was absurd. That is what I was fighting. It is a simple question of sanitation. I have seen thousands of cases in the stock-houses in this country, and most of the cases are confined to tumors. It seems to me that Dr. Williams has had the misfortune to be somewhat misled, and that, perhaps, largely explains why he has had such an adverse view of actinomyces. I should be very glad to hear the subject further discussed.

Dr. SALMON: Mr. Chairman—This matter of actinomyces has been one of the most important practical questions, as well as a very important scientific question in this country for several years, and I am very glad that this Association has taken the matter up and discussed it. I am glad to say that as an interest has been raised in the question I hope it will be kept before the Association, and that the members will not be content with discussing it and using the facts and assertions which have been advanced by others; but that they will make original and independent investigations of their own and bring new facts here before the Association which we can take into account in deciding the very interesting and very important questions which are continually coming to the front in regard to this class of diseases. In meat inspection this question has been very alarming, and I regret that it has been a source of embarrassment to the meat inspection service that opinions had been reached by people outside of the profession, from exaggerated statements on both sides, which have to a large extent influenced the meat inspection—opinions which were not based entirely upon scientific considerations.

Now, you all know that in the practical enforcement of laws, in the practical carrying out of a service like meat inspection, those in charge of it are obliged, to a certain extent, to conform their practice to the opinions of the country at large. If the people of the country are frightened to death in regard to a disease, whether it is dangerous or not, then it does not do for this meat inspection service to pass animals which are affected in any degree with that disease, or it will unsettle a large business and will destroy the confidence of the people of the country in the food which they consume, and this, as you all know, would be a very serious matter, indeed—so that those who are in charge of

meat inspection must take into account both the scientific facts found and the deep prejudices of the country at large. Here we can discuss this question from a scientific point of view. It is our duty to take up this question, and to bring the facts that bear on it to decide in an impartial and unbiased manner what is correct and what is not. And it is for us, after finding out the truth, to mould the opinions of the country at large so that the service of meat inspection can in time be brought to a scientific basis. Therefore, I look to this Association for aid, and will do everything in my power to increase the general interest in the subject and to interest our members in this matter.

Another important point in this question is the treatment with iodide of potassium. It seems to me that in the whole history of medicine we have not had any remedy that is so effective, either on this special disease or on any other disease caused by micro-organisms, as is iodide of potassium. And strange to say, although discovered by Thomassen in 1875, it was seven years before we accepted it in this country or knew much about it.

I think in Dr. Schwartzkopff's paper he rather gives the impression that Thomassen and others used the remedy on diseases of the tongue. They have shown that iodide of potassium was an agent which could be relied on to cure in a short time the most advance cases of this disease. Dr. Norgard, however, an Inspector of the Bureau of Animal Diseases at Washington, has applied this to lumpy jaw, about which so much alarm has been raised by the people of the country, and he has shown that this disease, when it is far advanced, when it would seem to be unsusceptible to internal treatment, readily yields to iodide of potassium. If the treatment proves effective it will be most valuable to the stock interests, and the Department should be able to apply it to cattle and horses. For this reason Secretary Rusk has gotten together at Chicago nearly two hundred head of cattle affected with this disease, which are now being treated with iodide of potassium, and the treatment has already progressed sufficiently to show a very marked result. I hope at the next meeting to report in detail the result of the treatment upon this large number of animals, which will enable us to decide at once as to its exact value.

REPORTS OF STATE SECRETARIES.

IOWA.

THE sanitary laws of Iowa provide for the restriction and suppression of contagious and infectious diseases of man and his domestic animals, through the agency of a State Board of Health. The State Veterinary Surgeon is made a member of the Board of Health by the act creating the office, and he is given all the powers and prerogatives of the State Board in the suppression of contagious and infectious diseases of animals. The law provides for the appointment of Assistant State Veterinary Surgeons, and there are ten or twelve such officers distributed throughout the State, which facilitates prompt and economic service.

The public has been taught to recognize the more common forms of contagious animal diseases, by means of bulletins, annual reports, and descriptions in the public press, and property interests stimulate a prompt demand upon the State Veterinary Surgeon for the investigation and suppression of outbreaks in any part of the State. Quarantine and disinfection are successfully employed, and the State is quite free from "glanders," "tuberculosis," and like diseases. There have been no epizootics causing serious losses to the Iowa stock growers this year.

About one hundred graduates of veterinary colleges are now located within the State, the most of whom are reasonably prosperous. We have a State Veterinary Association, with seventy-two members, and two local associations of twelve to fifteen members each. Ten per cent. of the Iowa veterinarians are members of the U. S. V. M. A. It must be plainly evident that the veterinarians of Iowa take an active interest in the scientific, mutual, and moral progress of our profession.

S. STEWART,
Secretary for Iowa.

NEW JERSEY.

MR. PRESIDENT AND GENTLEMEN: I have the honor to submit, herewith, my report as Resident State Secretary for New Jersey.

Most all the States have a State Veterinary Society, but I am advised that there are at least two or three States that have no regularly organized or incorporated veterinary society at all. This is much to be deplored, but I venture to predict that it will not be many years until there will not be a single State in the Union without a State Veterinary

Society. While some States have no society, New Jersey boasts of two regularly incorporated State Societies. Both societies claim to have the same object in view, and the only difference I know of in their platforms is that the older society, known as the Veterinary Medical Association of New Jersey, recognizes non-graduates as well as graduates, while the newer society, known as the New Jersey State Veterinary Society, admits only college graduates to membership. I was formerly a member of the Veterinary Medical Association of New Jersey, and I have also been a member of the New Jersey State Veterinary Society, but I am not a member of either of the societies at the present time, and therefore I ought to be the better able to give an impartial report on the subject in question.

We have now in the State of New Jersey a law regulating the practice of veterinary medicine and surgery. Under it all practitioners are required to register. Those recognized by the law are firstly, college graduates, and secondly, such persons as have practised veterinary medicine without a diploma for five years before the passage of the act. Then practitioners were required by the law to register within six months after the passage of the act. So the number of irregular practitioners who have a lawful existence in New Jersey are limited to those who availed themselves of the opportunity given them by the Legislature to register within six months after the passage of the act. The six months' clause in the act, as all will perceive, is a very essential feature of the law. Under the law no more non-graduates can now register, the time allowed having long since passed away. All those who make application to register now must be college graduates, consequently, as years go on the number of college graduates will keep constantly increasing, while no new addition can be lawfully made to the non-graduates, and, consequently, it is only a question of time until the graduates will rule.

It seems to me that the State societies should take this into consideration, and if necessary, change or amend their constitutions so as to comply with the State law, and I do not believe that they would be fostering quackery if they would admit those few who, without diplomas, did register, as provided by law, within six months after the passage of the act as well as college graduates. No one in the State has fought quackery more earnestly or is more interested in the elevation of the profession than your humble servant, whom you have intrusted to make this report, but, in obedience to the law, which is destined to bring about the desired result, and in justice to those who, perhaps, are less fortunate than ourselves, I would recognize all practitioners lawfully registered under the law, provided they pass a satisfactory examination before the Board of Censors, and inasmuch as this would settle beyond dispute the vexed question of graduates and non-graduates, so far as New Jersey is

concerned, and as "in union there is strength," I believe that the two societies of the State ought now to consolidate on the basis I suggest in this report. I believe what I suggest is feasible, rational, and for the good of the entire profession of New Jersey, and I trust that this National Association will counsel and assist the profession in New Jersey in her struggle.

The profession of New Jersey shows her strength in these halls here to-day, new applicants for membership from her confines, numbering no less than twenty, many of them being among our most successful and highly respected practitioners. I can say without fear of contradiction that never before in the history of the progress of veterinary medicine has the profession of New Jersey been so fully represented.

The most important matter, from a practical, business, and commercial point of view that I have to report at this time is the extermination of contagious pleuro-pneumonia in New Jersey by the United States Bureau of Animal Industry, and I would add in this connection that this Bureau of the Government has not only been successful in stamping out contagious pleuro-pneumonia in New Jersey, but that it has, after years of systematic and determined work, stamped this exotic plague out of the United States. In exterminating pleuro-pneumonia in the United States the Bureau has accomplished a work that the Government of Great Britain and that of some other nations have not yet succeeded in doing. The benefit of this work to the American people is of incalculable value, and it will be the means of removing embargoes against our exports and of opening to us the markets of the world.

New Jersey is so geographically situated, has such large live-stock centres, and so much animal traffic as to be more exposed to infection from contagious diseases than many of her sister States. The control of the contagious diseases of animals has for years been in the hands of the State Board of Health. Dr. Hunt, its chief executive officer, assisted by some of the ablest veterinarians of the State, accomplished as much as could reasonably be expected with the limited means at his command, but contagious pleuro-pneumonia was one of those diseases not to be stamped out in a day and not without Interstate and National Law. Hudson and adjacent counties had for years been infected with the exotic plague. In the matter of the extermination of contagious pleuro-pneumonia, the United States Bureau of Animal Industry with Federal authority, which the State did not possess, came to the rescue of the State Board, and has carried on the work of extermination to the satisfaction of the State, and in no small degree to the prosperity of the nation. Burdensome restrictions had been imposed upon our meat and cattle imports by foreign governments on account of the existence of the plague, which was a source of great detriment to American interests,

but the result of the work of extermination of contagious pleuro-pneumonia by the Bureau of Animal Industry cannot be other than such as to cause foreign governments to remove obnoxious restrictions which they have for years been imposing upon our live-stock trade. If the work alluded to, even if only in a small degree, is instrumental in assisting in opening to us the markets of the world for our live stock and meats, it is of immense value, not only to the animal industry, but to whole American people.

WM. HERBERT LOWE,
Secretary for New Jersey.

COMMITTEE ON DISEASES.

MR. CHAIRMAN AND GENTLEMEN: So many are engaged at present in the investigation of diseases, and the literature upon the subject is so very voluminous that a mere repetition of the conclusions arrived at would make of itself a report too extensive for this occasion. I have therefore decided to confine my remarks to the question of immunity and cure of infectious diseases, inasmuch as important discoveries have been made in this direction, and the question has equally a scientific and a practical value.

We seem to be at the beginning of a new era in therapeutics, based upon a clearer understanding of the etiology of the infectious diseases. Specific remedies have long been sought, but it is only recently that we have learned where to look for them. We have only passed over the threshold of the new knowledge. The practical application of the scientific truths discovered is not in all respects clear, but we can confidently predict that these truths are going to lead to important advancement in the prevention and treatment of infectious diseases. It is a matter of just pride to us that the first demonstration that immunity can be produced by the chemical products of bacteria was made in this country, and by one of our own members, Dr. D. E. Salmon, Chief of the Bureau of Animal Industry. This discovery was made in the case of hog cholera, published in a paper read before the Biological Society, at Washington, in the beginning of 1886.

A great deal has been done in this line which is quite suggestive of what we may expect in the near future. You are all aware that infectious diseases are produced by the introduction into the system of specific micro-organisms. That these micro-organisms produce disease in two ways: 1. By toxic effects, in which case the bacteria, growing locally, give rise to constitutional symptoms by an absorption of their poisonous products, *e. g.*, tetanus, diphtheria, Asiatic cholera, etc. 2. By a septicæmia in which the organisms grow rapidly throughout the whole body and in which poisonous products are formed, but in less concentration.

It is well known that not only must we have the disease-producing agent, but that the animal body which receives this agent must be at the time in a condition capable of permitting the growth of the agent, and also incapable of neutralizing the poison. If, then, we can bring about such a condition that the invading micro-organisms will not grow,

we have the condition of immunity. We can also prevent infection by rendering the body proof against the poison. Recent researches appear to show that more is to be expected from means of rendering the body poison proof than from means of directly killing the bacteria. If we are able to neutralize the poison produced by bacteria we deprive them of their principal weapon of attack, and reduce them to the condition of harmless saprophytes.

One of the most important discoveries is that the natural cure of an infectious disease is due to the formation of an immunity substance in the body, this substance being a direct antidote to the poison. If we can introduce directly this immunity substance, or hasten its development, we can cure the disease. In other words, the new specific remedies are such as accomplish these ends.

Infectious diseases themselves confer immunity against a second attack for a greater or less length of time by the formation of an immunity substance, which acts as an antidote against a new invasion of the same organism. An attack of smallpox confers immunity against further attack, as a rule, during the patient's lifetime. An attack of croupous pneumonia confers immunity in human beings only for a short time. It is upon a knowledge of these facts that the system of experimental therapeutics on the line of immunity has been inaugurated.

Much has been accomplished in the laboratory. Much remains to be done before it can be put to practical use. I do not propose to review the whole literature upon this question, but to confine my remarks, principally, to a brief review of what has been done in some of the diseases which are of practical interest to us as veterinarians.

I will speak first of tetanus.¹ The time has long since passed when the old idea was entertained that tetanus is a purely nervous disease, produced by injury to a nerve, or from an unknown cause, giving rise in the first instance to the term traumatic, and in the second instance to the term idiopathic tetanus. Shortly before the discovery of the tetanus bacillus it was shown by Carle and Rattoni that animals inoculated with the pus from individuals affected with tetanus developed the same disease, thus proving that it was due to infection.

In 1884 Nicolaier, at the Hygienic Institute, in Göttingen, produced the disease in rabbits by the subcutaneous inoculation of garden earth, and discovered the specific tetanus bacillus.

In 1886 Rosenbach demonstrated the presence of the same organism, though mixed with others, in the pus at the seat of inoculation in human

¹ For the purpose of making clear what I shall have to say later, I venture to treat this matter somewhat extensively, though the subject has been treated in detail by Dr. Harger in the August number of the *Journal of Comparative Medicine and Veterinary Archives*.

beings. Great difficulties were encountered in obtaining the organism in a pure state, on account of its being mixed with others, and on account of its being strictly anaerobic, so the etiological significance of the organism was not definitely established until Kitasato obtained pure cultures, which he did by an ingenious process in 1889, depending on the fact that the other bacteria which were present were killed by exposure to a temperature of 80° C. for a period of from three-quarters of an hour to an hour, while the tetanus bacilli survived this temperature for this length of time; these bacilli planted in liquefied agar, preferably containing about 2 per cent. of grape sugar through which liquefied agar hydrogen gas was passed to displace the oxygen, grew in pure cultures.

The bacilli of tetanus are straight rods, or threads may be formed. These bacilli form spores especially rapid at high temperature. The spores are round and situated at the end of the rods, which gives a drum-stick appearance to the organism. They possess distinct but sluggish independent motility. After the spores are formed the bacilli are non-motile.

The spore material will withstand complete drying for many months. They will, in a moist condition, survive a temperature of 80° C. for an hour, but are killed in five minutes at 100° C. They are not killed in 5 per cent. carbolic acid solution after an exposure of ten hours, but are killed after fifteen hours. They are killed in three hours in a 1:1000 sublimate solution. They liquefy gelatin slowly with a feeble gas production. The growth in solid cultures may be compared to the appearance of a brush such as is used for cleaning lamp chimneys. The bacillus grows best at the body temperature, but will grow slowly at 18° to 20° C. There is no growth under 14° C.

There is no organism to which such a large number of different species of animals are susceptible. Chickens are the only animals positively known to be naturally immune, although, of course, not all animals have been tested.

The bacilli are toxic in their effects, and produce death by the poison which they form. In animals inoculated with a pure culture of tetanus, the bacilli develop locally, but do not invade the blood. They are found only at the seat of inoculation. The tetanic symptoms appear first near the part of the body inoculated. For example: If the inoculation is made in the left hind leg, the muscles in that leg will be first affected. If the inoculation be in the neck, the cervical muscles are first stiffened. The symptoms gradually become more general, and, finally, we have convulsions which are excited especially by external influences. At the autopsy of animals inoculated with a pure culture we find no marked local reaction. There is hyperæmia, but no suppuration at the point of inoculation.

In natural infection with tetanus, it is to be remembered that other

organisms are present besides the tetanus bacilli, and these other organisms may be such as cause suppuration, gangrene, etc.

In Kitasato's experiments with pure cultures the curious fact was noted that the bacilli die before the animal dies. Neither at the seat of inoculation or elsewhere can the bacilli be found. This will explain why it is possible to miss the bacilli at the point of inoculation in animals dead of natural infection.

One can form some idea of the intensity of the poison when he bears in mind that experiments on mice have been made with a view of stopping the action of the bacilli by extirpation of the inoculated area soon after the inoculation has been made. One hour after the inoculation a wide area has been cut out at the seat of inoculation, and the surface burned. This failed to check the progress of the infection, showing that already enough poison had been produced and absorbed to kill. This applies to mice inoculated with pure cultures, but the conclusion may be drawn that before any symptoms have made their appearance the removal of large areas containing all of the bacilli will not necessarily prevent the development of the disease.

Subcutaneous inoculations of mice with pure cultures develop symptoms in twenty-four hours, and cause death in two to three days.

Mention of the manner in which the tetanus organism kills leads us to a study of the chemistry of the organism.

Brieger, in 1887, endeavored to obtain the poison products. He found crystallizable alkaloidal substances of the class called ptomaines. He designated them as tetanine and tetano-toxine.

Tetanine produces symptoms something like those caused by strychnine, and these he supposed to be the specific poisons of the disease. This has since been found to be incorrect, as a far more deadly poison was subsequently demonstrated by Brieger and Frankel, which belongs to a totally different class of substances—namely, the toxic albumins, to which class we know now that most of the specific chemical poisons of bacteria belong, and not to the ptomaine class, as formerly supposed.

This toxic albumin of the tetanus organism is contained in the filtrate obtained by passing a liquid culture of the tetanus bacillus through a Pasteur filter, precipitating with alcohol and dissolving with water. Inoculations with this bacteria-free filtrate into animals produce all of the symptoms of tetanus in a length of time proportionate to the size of the dose. The symptoms may appear in from seven hours to three days. Blood from animals sick with the disease will produce tetanus in one generation following.

From a rapid review of the description and history of the organism, with its chemistry, let us see what has been done in the production of immunity, both preventive and curative.

Kitasato first succeeded in rendering rabbits immune against tetanus

by injecting the filtrate of a bouillon culture of tetanus bacilli, and following the injection immediately by the injection of the trichloride of iodine, and repeating the trichloride of iodine injection at intervals of twenty-four hours for several injections.

These experiments were successful, however, in only 40 per cent. of the rabbits treated, and it had no effect on mice and guinea-pigs. The blood of the immunized rabbits, it was found, would confer immunity on other animals, including mice and guinea-pigs, and would cure the disease when injected into infected animals after the symptoms had developed.

It was found at the same time that the blood of chickens, which are naturally immune against the disease, when injected into rabbits and mice, would not confer immunity against tetanus. This may be laid down as a rule: that only animals rendered immune artificially can confer immunity to other animals. The property conveyed to the blood of an animal when it is immunized is the power of destroying the poison of the disease, but only of the poison of the disease against which it has been rendered immune. Thus an animal which has been rendered immune against tetanus is not protected against any other disease, such as chicken cholera, diphtheria, etc.

In addition to the method of immunization before mentioned, the culture itself may be treated with the trichloride of iodine, which makes an immunizing fluid against tetanus, even for mice, which do not respond to the first method. Horses and sheep have been rendered immune by Behring and Schütz by treatment with the tetanus bouillon filtrate containing carbolic acid and trichloride of iodine.

The method of immunizing with trichloride of iodine has a serious practical objection, from the fact that the drug itself has very caustic effects, and that there are more failures than successes by this method.

Brieger, Kitasato, and Wasserman have recently found the most successful agent of vaccination against tetanus to be the following: A mixture of a twenty-four-hour culture of the tetanus bacillus in neutral peptone bouillon with the extract of the thymus gland of a calf, in the proportion of one part of the culture to two parts of the extract from the thymus gland. This mixture, allowed to stand for several days in the cold, has been found to be an excellent vaccine, with which all the rabbits experimented upon were rendered immune, as was also a goat. The juice of the thymus gland has the specific power of neutralizing the poison of tetanus. By this new method of vaccination we are able to produce immunity in animals positively and readily.

The blood of the animals—for instance, rabbits, goats, horses, etc.—contains a substance which acts as a direct antidote to the tetanic poison. This is proven by mixing poisonous bouillon cultures of the tetanus bacillus with this immunized blood, and finding that thereby

these cultures are deprived of their toxic properties. Also, and more to our purpose, the same important fact can be demonstrated by injecting the blood serum of an immunized animal into a second animal, and in this way the second animal may itself be rendered immune against the disease.

We must, however, as Ehrlich has shown, distinguish between the immunity conferred in this way and that produced by vaccination.

In the first case we introduce directly the already formed immunity substance. Immunity is produced at once, or in a few hours, but the degree of immunity is only a fraction of that of the original animal. Whereas, when we produce immunity by the vaccine substance we must wait for several days for the formation of the protective immunity material, but in compensation we can attain a higher degree of immunity in this way than by the use of the blood serum.

This matter of the degree of immunity is important. Ehrlich proposes to designate in figures the degree by determining how large a fatal dose the vaccinated animal will stand. Thus the degree of immunity may be 2—20—500—1000, etc.; in other words, the animals will stand 2—20—500—1000, etc., times the fatal dose.

Not only can we use the blood of a vaccinated animal to produce quick immunity, although not of high degree, in a second animal, but we can actually prevent the development of the disease after inoculation with the specific organism; even more, we can cure the disease after symptoms have developed, if it is not too far advanced. In other words, the blood serum of an immunized animal possesses powerful curative properties.

This blood-serum therapy, as it is called, is now a demonstrated scientific fact, whatever may be the fate of its practical application. It has been applied already successfully in the treatment of seven cases of tetanus in human beings. These patients were cured of tetanus, which, as is well known, is very fatal, by using the immunity substance obtained from the blood of rabbits rendered artificially immune.

The degree of curative power possessed by the blood serum depends upon the degree of immunity attained. According to Kitasato, the more susceptible an animal to the disease, and the higher the degree of immunity produced artificially, the greater the curative power of the blood serum. He believes that the horse, rendered highly immune by vaccination, will furnish the most healing blood serum.

There are some practical difficulties in the application of blood-serum therapy which at present forbid its general application. First, the blood serum of one species of animal is more or less injurious to another species. This consideration is not without force if we have to use large quantities of the blood serum, and it is probable that in endeavoring to cure such large animals as the horse, or to cure a man, it will be neces-

sary to use such large amounts of the curative serum that the application would be virtually a transfusion of blood. If, however, we are able to obtain the blood from an immunized animal of the same species this danger would be greatly reduced.

Secondly, it is not easy to obtain and preserve the blood serum in an aseptic condition.

Thirdly, there are practical difficulties in obtaining at the right moment vaccinated animals.

A large part of these difficulties would be overcome if we were able to isolate, as a distinct permanent chemical substance, the curative substance from the blood. Efforts in this direction are only partly successful thus far, but we may hope that they will be eventually successful.

In the meantime experiments have been made to obtain directly from cultures curative substances. You are familiar with the first step in this direction, viz.: the introduction of tuberculin by Koch.

The expectations originally held have unquestionably been disappointed as regards the healing power of this substance. Its diagnostic value has been proven. In this connection I need only refer to the valuable and accurate researches of the Tuberculosis Commission of the University of Pennsylvania, of which Dr. Zuill is chairman.

The belief is entertained by Buchner and others that Koch's tuberculin is essentially a solution of the protein constituents of the tubercle bacillus. We distinguish the specific poison produced by bacilli from their bacterio-protein constituents. It is claimed that the specific reactions of tuberculin can be obtained by the solutions of bacterio-protein from other kinds of bacteria.

It has been found that the concentrated bouillon culture of the diplococcus pneumoniæ heated to 60° C. are deprived of poisonous properties, but are capable of conferring a high degree of immunity, and the culture material thus treated has been successfully used in treating pneumococcus infection both in animals and in human beings, so that we have here an instance in which the culture material can be used as a therapeutic agent. Such material is much more easily prepared and manipulated than the curative blood serum, and we may hope that we shall come into the possession of valuable therapeutic agents obtained directly from cultures.

The general principles which have been described regarding the production of immunity and the cure of tetanus are applicable to many other diseases, such as swine erysipelas, or "rothlauf," pneumococcus infection, diphtheria, etc.

The interesting discovery has been made by Tizzoni and Cattani that the blood serum of rabbits rendered immune against rabies by Pasteur's vaccination is a direct antidote to the specific poison of rabies, depriving virulent spinal cords from rabid animals of all toxic property.

This blood serum is even capable of curing rabies in inoculated rabbits after symptoms have appeared. This discovery is a welcome addition to Pasteur's work.

Glanders has received considerable attention lately, with the result that a substance of great diagnostic value, called "mallein," has been discovered. This substance has undisputed value as a diagnostic agent, reacting in animals the subject of glanders and having no effect on healthy animals. I refer you for details to Dr. Pearson's writings upon the subject in the *American Veterinary Review* and the *Journal of Comparative Medicine and Veterinary Archives*.

In conclusion, your committee takes great pride in recording the fact that such an active part is being taken by our American veterinarians in the scientific and practical investigations of the diseases which affect our domesticated animals.

A. W. CLEMENT.

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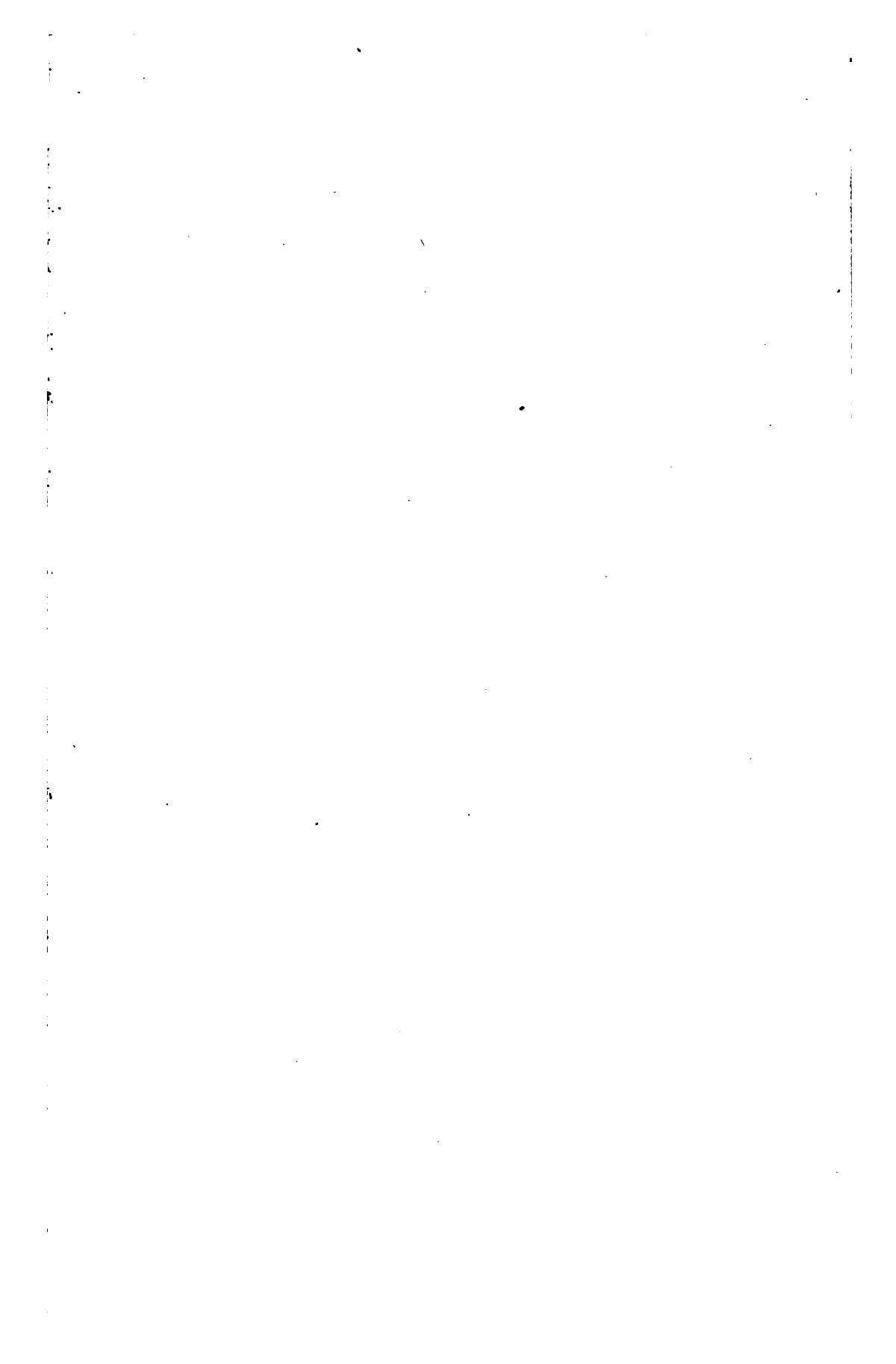
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